Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Telephone Weekly, Telephone Magazine, Telephone Securities, The Telephone and Sound Waves
PUBLISHED WEEKLY BY THE TELEPHONY PUBLISHING COMPANY, MONADNOCK BLOCK, CHICAGO

VOLUME 63, NUMBER 13
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CHICAGO, SEPTEMBER 28, 1912

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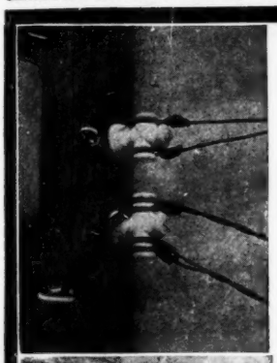

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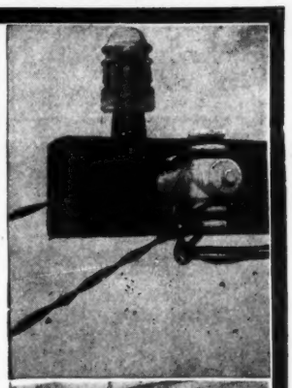

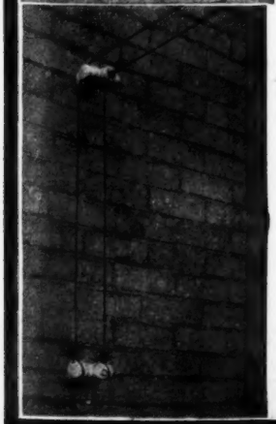

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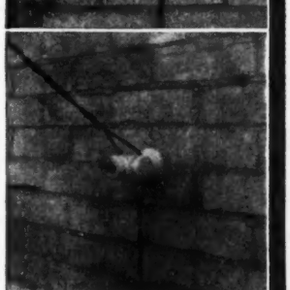

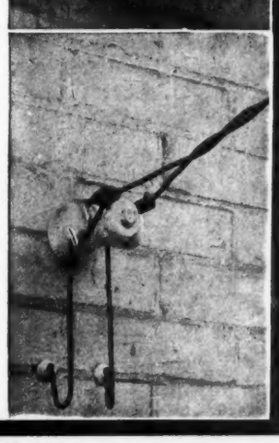

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Telephony.

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Entered as second-class matter September 4, 1908, at the post office at Chicago, Ill., under act of March 3, 1897

Volume 63
Number 13

CHICAGO, SATURDAY, SEPTEMBER 28, 1912

Subscription - 10 Cents a Copy
$3 a Year U. S., Cuba and Mexico
$4 Canada, $5 Other Countries

EFFICIENCY.

Efficiency is the capacity of doing the right thing at the right moment, with little or no premeditation. Adaptability is not efficiency. Efficiency in any calling is not intuitive. As a rule, it is a personal acquisition that has only been achieved through wide experience and the practical application of that experience to definite ends. Efficiency is not an intellectual endowment, although certain intellectual attributes favor efficiency or make, with the indispensable experience, an efficient man or woman.

The most salient indication of efficiency, objective and subjective, is self-reliance. Self-reliance is not will in the sense of pugnacity, of obstinacy—pluguglíness. Efficiency is self-reliance modified by circumstances. Self-reliance is the gift of experience and of practice. A self-reliant man is not a man who adheres to his own opinion in the face of the unfortunate experience of others and even of himself in the past.

The self-reliant man says to himself, "This course is right, will lead to success, because, to my knowledge and that of others, it has invariably done so. If my action in this instance results in failure, it will be due to extraneous causes, not that the principle that dictates my action in this instance is wrong."

Efficiency, then, is mainly self-reliance regulated by principles that have acquired the consistency of rules.—Brains.

Investigations of Transmitters and Receivers.

At the annual convention of the Institute of Electrical Engineers, a paper was presented by Dr. J. B. Whitehead and C. F. Meyer, dealing with the subject of the vibrations of telephone diaphragms. The paper which was published in full in TELEPHONY, indicates that some progress is being made in the study of the causes of the various sources of speech distortion in terminal telephone apparatus, i. e., the transmitter and receiver.

The investigations made by Dr. A. E. Kennelly and Prof. G. W. Pierce into the impedance of telephone receivers as affected by the motion of the diaphragms, furnish further information upon the subject. The idea that the present type of receiver is not ideal has long been entertained and the fact brought out by these investigations, that free resistance and reactance under marked changes as the frequency passes through the natural period of vibration of the diaphragm, confirm that conclusion. The investigations of Dr. Kennelly and Prof. Pierce are abstracted in this issue.

There is no doubt that the researches which have been started, will be instrumental in ascertaining the causes of the phenomena which now are factors in producing the speech distortion.

How the Commercial Agencies View the Situation.

We have printed considerable about prosperity recently. We believe in it. We are confident that it is here. Evidences of that fact multiply continually. And we want to enthuse everybody with a proper optimism. The latest evangels are the two principal commercial agencies of the country, Dun and Bradstreet.

Dun's Review this week says, in part: "Basic conditions now present the best exhibit seen in some years. The restoration of confidence permeates the important channels of industry, commerce, and finance, and planning ahead is the primary influence calling for prompt attention.

Operations in securities disclose a cautious disposition among investors, but the increased value of money is the natural result of better times and another notable rise in the payments through banks is evidence of trade progress."

Bradstreet gives a brief resumé of conditions equally hope-

ful. It says: "All in all, business, despite this or that irregularity, is certainly in excess of all but the best of previous years, and the fact that there is no disposition to rush things indicates healthy conservatism that tends to make the absence of speculation conspicuous, and this situation augurs well for a steady trade rather than fitful outbursts of activity."

The Employe's Bearing on Public Relations.

In a recent letter to the employes of the Portland (Ore.) Railway, Light & Power Co., S. B. Josselyn, president of the company, pointed out how potent the employe is in the establishment of favorable relations with the public. He said in part:

"A disinterested stranger has taken the trouble to write me a letter commenting upon what he terms the difference between the inside and outside policy of our company. This gentleman compliments our officials for their excellent policy in striving to please the public in all matters but says there is a large amount of feeling against the company, founded wholly on a misunderstanding by the public of our policy, which is caused by false impressions reaching the individual through some overt or careless act of some subordinate employe. He also calls attention to the fact that the spirit of pleasing or endeavoring to please in every detail, however trivial, throughout our great organization, particularly at every point where our employes come in touch with the public at large, is the proper means of overcoming criticism and complaint.

He suggests that the excellent policies we have shown in our inside organization be reflected through our employes, who come in contact with the public, in smiles and good service, instead of permitting the public to get the idea that we are oppressive in our management and operations.

It is a little embarrassing to feel that our policy and efforts to please are to some extent destroyed by the thoughtless action of some one or more of our employes, by their not being courteous at all times. It must be remembered that any act of any individual employe that causes a bad feeling on the part of one of our patrons is a direct censure of the corporation as a whole. No amount of publicity and proper policy adopted by a management can produce the results desired unless each individual employe does his part in carrying out that policy. Will you not, in the future, kindly consider the embarrassment you cause the company as a whole by any thoughtless or improper act of your own, and strive from now on to provoke a better understanding and a better feeling between the public we serve and the corporation which gives you employment?"

Perfection is a difficult target to hit but a good one to aim at.

One View of Workingmen's Compensation Act.

The New England (Bell) Telephone & Telegraph Co. has decided to not adopt the workingmen's compensation act, which was passed by the last Massachusetts legislature, and which became a law July 1. The reasons for this stand are set forth in the company's publication, Telephone Topics. as follows:

"While the workingman's compensation act has many excellent qualities, it does not seem to offer to employes of the New England Telephone & Telegraph Co. as many advantages as are contained in the general practice of the company for the past few years.

Instead of compelling employes to seek justice through the courts, a process that involves heavy expense, the effort has been to do substantial justice to an injured employe by reimbursing him for expenditures for doctors and medicines and also to pay him a fair proportion of his wages while incapacitated. This has been the general practice, and it has worked out very satisfactorily.

The great majority of accident cases reported incapacitate the employe for less than a fortnight. Under the compensation act an employe would not receive anything until a fortnight after his accident and then only half pay, while under our present practice employes are fairly compensated for loss of time when their disability is less than two weeks, and are reimbursed for medical attendance. The existing practice is, it is believed, more beneficial to the employes as a whole, and the adoption of the compensation act would seem to be a step backward.

If the practice of the company averages to cost a little more, it is worth much for the significant reason that at no time is the employe in the position of a litigant forced to seek his legal rights and therefore in the antagonistic spirit of an adversary, but is at all times an employe between whom and the company there exists only a feeling of kindly sympathy. This vital element of mutual good will cannot be measured in dollars and cents, but that it has a very great value no one can deny. Moreover, it is not confined to the injured employe. Knowledge of fair and generous treatment to an individual has a way of making itself generally felt, and what is done for one is really appreciated by many.

This appreciation spells real efficiency. It is worth a great deal, doubtless much more than the saving that might be effected by adopting the compensation act, and the probabilities are this act will not be adopted as long as the present kindly relations between employer and employed are continued."

If this were the general practice of large companies, statutes of the nature of the one under consideration would be unnecessary. Unfortunately the practice is not general, and in such cases it would appear that some protection should be accorded the employed. Just what form this protection should take is still a disputed question.

"Some" Conservatism!

In his article last week, Mr. Kelsey stated that, out of 35,000 stations in Mineapolis, the Tri-State Independent operated 18,000. This was genuine conservatism. Mr. Kelsey, ever alert to avoid over-statement, stood so straight in this case that he leaned backward. The Tri-State company, we are reliably informed this week, has upwards of 23,000 telephones in Minneapolis, a number considerably in excess of the Bell list. Evidently, the Tri-State is growing so rapidly that even Mr. Kelsey can't keep pace with it.

Don't take it that all the things written about improved business methods are intended for the other fellow. If you make a practice of trying them on some of them will fit.

Alone or Together?

"Can you alone roll a stone up a hill as fast or as easily as you and I can together?" says an anonymous writer. "Can you alone win a game of ball as well as you and I, and a good team back of us, can together? Can you alone swim against a stream as easily as you can with the help of a strong swimmer? Can you alone, afoot, travel as fast as you can on the back of a good horse? What, that is worth while, can you do alone? Then let us, you and I, work together."

Ft. Dodge Telephone Company's New Exchange Building

Plan of Modern Structure in Which Iowa Independent Will Soon House Latest Equipment, Converting Magneto System into Common Battery—Brief Resume of Company's Gratifying Record of Expansion Since Organization in 1896

By John D. Holland

This paper recently announced the voting of a material increase in the capital stock of the Fort Dodge Telephone Co., Fort Dodge, Iowa, and the contingent proposal to erect a new exchange building and to convert the magneto system into a common battery plant. These arrangements have been perfected speedily. The plans of the new modern fire-proof building are here shown, together with the architect's drawing of the front elevation. A contract has been closed with

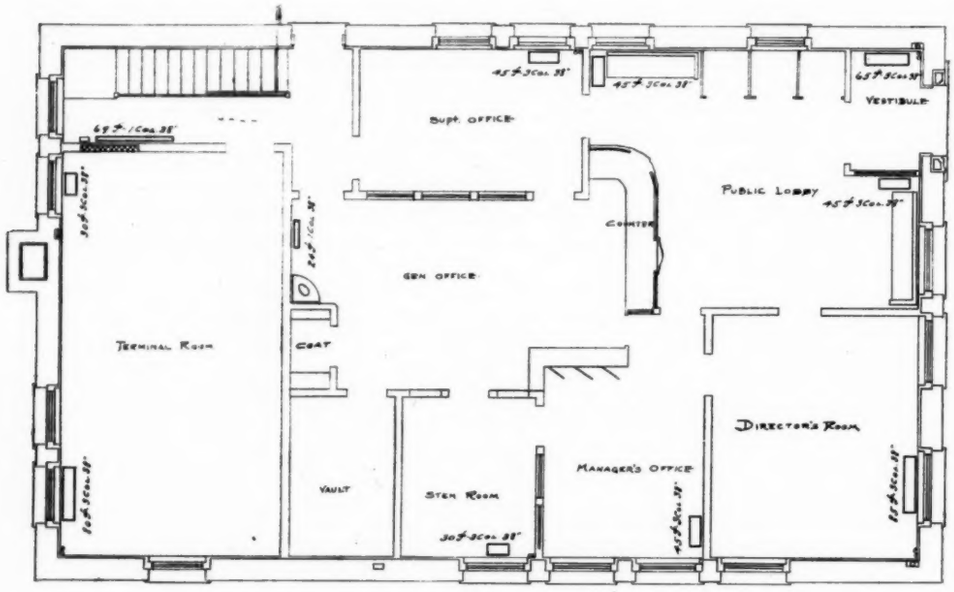
Architects' Drawing Front Elevation of New Fireproof Exchange of Fort Dodge (Iowa) Telephone Co.

the Kellogg Switchboard & Supply Co., of Chicago, for its latest 1,400 line, common battery multiple switchboard, work on the building is well under way and it is expected that, by January 1, 1913, the new equipment will be installed and the system running smoothly.

The history of the Fort Dodge Telephone Co. is an interesting one, particularly as it presents an unbroken record of success. The company was organized in Fort Dodge on May 12, 1896, for a period of twenty years and with a capitalization of $10,000, by a group of local men, who had as an object the two-fold purpose of securing a reasonable return upon the money invested and the rendering of improved telephone service at a reasonable rate. Some delay ensued, but, on June 22, 1898, a franchise ordinance was passed by the city council, which was later ratified at a special election held on July 25, 1898.

Immediately thereafter the telephone company secured the services of Gifford Hoag, as manager and a contract was entered into with the construction firm of Jones & Winter for the erection of a telephone plant in the city of Fort Dodge, which was to have an ultimate capacity of 300 lines. Perhaps the two most notable features in the specifications were the provisions for full metallic service on the one hand and the placing of all wires underground in the entire business district of the city, both of which practices were uncommon at that time in Western cities of a similar size. The orig-

inal expression of support made by the business interests of Fort Dodge, upon which the company based its contract, consisted of 244 signed contracts for service. But, even before the plant had been completed and service was given, this number had been increased to over 300 and the process of extension begun which has continued uninterruptedly ever since, until now the company has over 3,400 subscribers.



First Floor Plan—Lobby and General Offices.

On August 12, 1898, it was found necessary to increase the capital stock to $15,000; on March 30, 1899, it was again increased, this time to $25,000. On September 1, 1899, Jos. M. Plaister, succeeded Mr. Hoag, who tendered his resignation because of ill health. It is very generally conceded that to Mr. Plaister's varied abilities and constant efforts the success of the company is largely attributable.

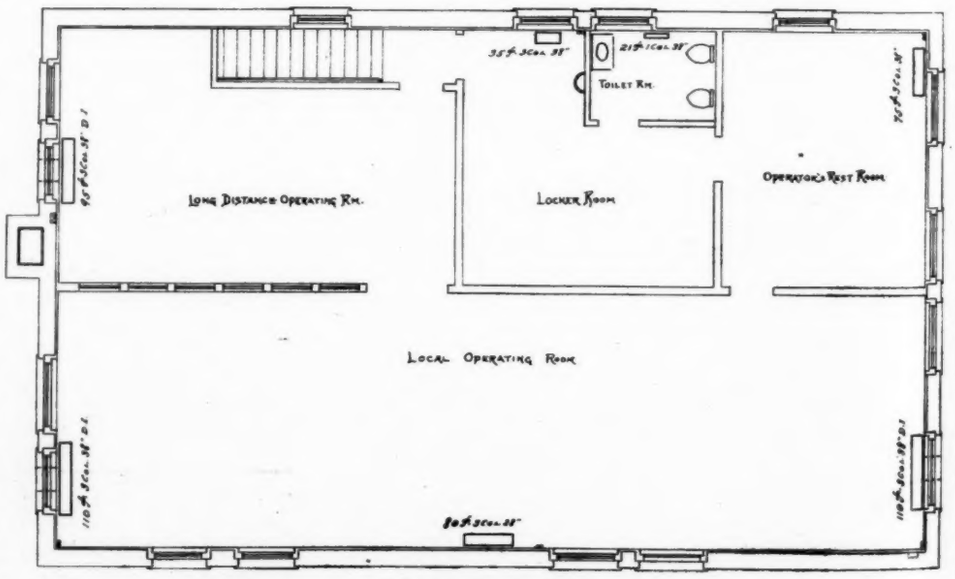
In March, 1901, the company installed a Kellogg 900 line multiple magneto switchboard, which replaced the original board furnished by the Sterling Electric Co., then of Chicago, and which had been entirely outgrown. On June 10, 1901, the stock was again increased, the total being raised to $50,000. This was followed on January 6, 1903, by a further increase to $100,000.

In 1904, the Iowa Bell company rebuilt its entire plant, substituting common battery service for magneto, but this did not in the least degree affect the growth of the Independent company, which has continued to the present day without the slightest interruption. In June, 1910, the Fort Dodge company purchased the entire local plant operated by the Iowa company, merged the two, and transferred the Bell lines to a new Monarch six position toll board, which was installed at that time.

Starting in a small way, in two rooms, on the rear of the second floor of a down town business block, additional rooms were obtained as fast as necessary until, in December, 1911, the limit was reached. This, in connection with the fact that it was no longer possible to give better than very fair service with equipment which had become obsolete, led the management to determine upon a complete rehabilitation of the property during the year 1912. To this end, a contract was let with the Jensen Construction Co., of Fort Dodge, for the erection of a modern fire-proof telephone building upon property acquired by the company just one block north of the present location of the offices. The new Kellogg board which will be housed there will be absolutely up to the minute, there being incorporated such features as automatic listening without keys, automatic ringing and secret service, which prevents the operator from listening in upon a connection which has been fully established.

The company's original franchise stipulated a maximum rate of $12 per year for residence service and $24 per year for business service. These rates have been maintained up to date with the exception that fifty cents a month is charged for desk set service. It was realized that higher rates would be necessary to permit the new installation and the rendering of better service, and, after a careful investigation and report upon the matter by the Commercial Club the proposition was submitted to the subscribers. There it received an affirmative vote of a trifle better than 76 per cent., a splendid endorsement of the company's accomplishments and its standing in the community.

Preliminary to proceeding actively with this year's work the authorized capital stock of the company was, on January 16, 1912, increased to $300,000, as has already been reported by TELEPHONY. A sufficient amount of the new stock has now been sold to complete the improvements. Every dollar of the capitalization is owned by Fort Dodge people, the stockholders numbering between fifty and sixty.



Second Floor—Operating and Operators' Rest Rooms.

There are three features of the new building especially

worthy of mention, as not being followed in the majority of cases. These are: The manager is in almost direct connection, personally, with the public and may be reached at all times without any red tape of any nature whatever; the manager has entire supervision of everything but the operating department without leaving his desk; the chief operator has entire supervision over the operating department both local and long distance without leaving her desk. These three principles are not new in the policies of the Fort Dodge company, but they are worked out to an unusual degree in the arrangement of the building. The floor plans here shown are self explanatory and indicate a general arrangement of a high degree of excellence.

The officers and directors of the Fort Dodge Telephone Co., are C. M. Oleson, president; Geo. B. Wheeler, secretary; Robert Healy, vice-president; E. G. Larson, treasurer; C. W. Maher. Jos. M. Plaister, as stated, is manager.

Rate Hearings Begin at Baltimore.

Hearings were started Monday afternoon before the Maryland Public Service Commission on the motion of the Protective Telephone Association, of Baltimore, for an extension of time for the old telephone flat rate privileges from October 1 to April 1, 1913. The association, representing a great part of the business community, is seeking the six months' extension for the purpose of allowing the subscribers to have further hearings before the final adjustment of rates.

Ogle Marbury, attorney for the association, declared that it was in a position to make out a prima facie case to prove that the Chesapeake & Potomac company's rates are too high.

"We have not been able to collect our full evidence up to this time," said Mr. Marbury, "but in six months' time the association feels sure it can prove its case conclusively."

Mr. Marbury added that the members, though convinced of the great demand for a flat rate in many parts of the country, had not yet reached any conclusion as to the choice of the Baltimore suburbanites. The six months' extension, he said, would allow time for making this choice in a proper and deliberate manner.

Shirley Carter, representing the Chesapeake & Potomac company, opposed the extension, declaring that after a most careful investigation of a year and several months, during which the public was represented at all times, the commission had agreed on a report. He recited the care and expense entailed in the investigation, with big business men in attendance, and he declared the Protective Association could not possibly get more information at its command in the next six months.

He argued against the legality of the flat rate under the construction of the law by the commission.

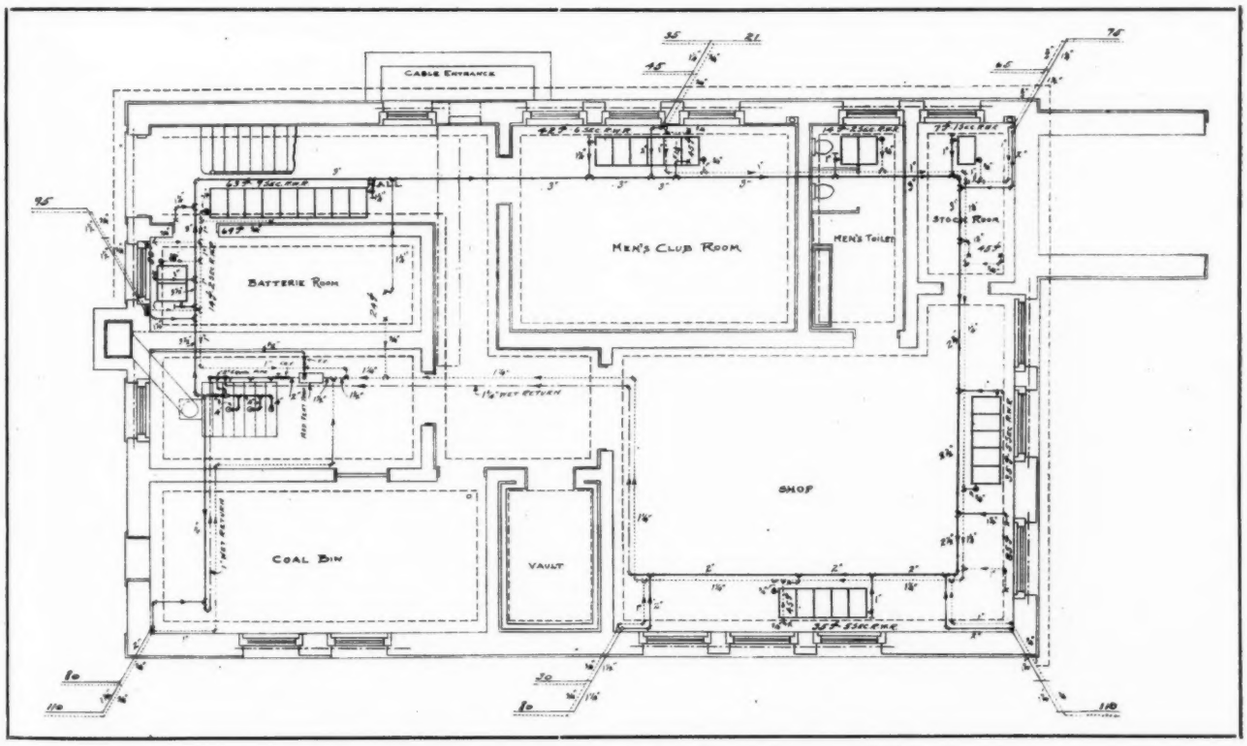
Consolidation in Kansas.

An important telephone consolidation recently took place in the northwestern part of Kansas. Several years ago a co-partnership was formed between Otis L. Benton, a banker for a quarter of a century at Oberlin, Kans., and Art S. Steele, a prominent and successful business man, also of Oberlin, for the purpose of buying up and putting together small telephone plants in that part of the state.

As a result of their efforts the following companies have recently been put together under the name of the Consolidated Telephone Co.: The Central State Telephone Co., the Oberlin Telephone Co., the Kansas & Colorado Telephone Co., the Atwood Independent Telephone Co., the Ludell Telephone Co. and the Beaver Valley Telephone Co. A new charter has recently been granted and the state utilities commission has authorized the transaction.

The various properties now owned by the Consolidated company cover a territory ninety miles east and west and forty miles north and south, striking four trunk line railroads, with exchanges at five county seat towns and entering territory inhabited by 40,000 to 50,000 people.

The officers of the Consolidated Telephone Co. are as follows: Art S. Steele, president; W. T. Stevenson, vice-president; Otis L. Benton, treasurer; H. O. Douglas, secretary.



Basement Plan of Fort Dodge Telephone Company's New Exchange.

Which Shall It Be?

Two or One?—Local or Universal?

By J. C. Kelsey

Human nature is a queer institution. We all seem to want that which we have not. The grass is green in some one else's pasture. The persimmons are better, too. It always is better farther on, apparently.

If a city has two telephone systems, it is easy to create a sentiment for one. If that same city had one telephone system, it is a dead cinch that the people want two, and would vote for two decisively!

Des Moines furnishes a good example. Not long ago their newspapers, at least, cried for one telephone system, and wasted much ink on the beatific conditions of one telephone system.

Later, these same institutions sent up a terrific wail about a telephone monopoly with its inevitable slackening of public service appreciation. And Des Moines will vote on the question of a competing telephone system. It's dollars to doughnuts it carries!

Jacksonville had one grand and universal system of telephones for several years. The promised joys of universal telephone service did not materialize. And a few days ago the vote for a second telephone system carried by two to one.

Just as I read the news of Jacksonville's vote in TELEPHONY, I received a bulletin from some one, entitled, "The Abolition of Two Telephone Systems." Truly, it was a sad coincidence. Needless to say, the bulletin was issued by the Bell.

I could not help but laugh at the first thought in this highly intellectual information bulletin: "Public sentiment in many cities is in favor of consolidation."

I could get out a similar bulletin, and its leading thought could be, "Public sentiment in many cities is in favor of two telephone systems."

There are ever two sides to any question. And it takes a great deal of cocksureness for anyone to make any predictions upon public sentiment. Anyone who tries to build anything on this will-o'-the-wisp foundation will find a great many disappointments in store for him.

The next thought in this information bulletin is along the lines of the telephone being a natural monopoly. How long will these people delude themselves with this phantom?

Does not this have a familiar sound? It comes from a Detroit paper called the Free Press, a misnomer, too. "The outcome renews the lesson that telephone service is essentially a natural monopoly." This refers to the sale of the Home interests to the Bell.

You would think, from the above lesson, that the Home Telephone Co. had failed, or some one had lost money. Such is far from the truth. The Bell company paid $3,500,000 for the Home property. Just where the lesson of natural monopoly fits in, I cannot explain.

"Monopolies are unpopular, and it is through the inevitable dislike for them that hungry promoters are able to induce cities to permit new ventures under the alluring pretense of providing competition." "The promoters come out all right, they look after that."

Just another jab at that poor creature called the "promoter." Thanks to easy money at Bell headquarters, this is true. I honestly believe they love promoters—they certainly have encouraged them enough.

I think this sentiment from the Detroit paper should be recorded. I expect to hear some bitter speech from this paper a little later, after the "one" telephone has the nerve to collect from newspapers for services rendered.

Talking about Independent "failures"—Peru, Ind., sold to the Bell for $150,000. All who believe that the promoters and owners "failed," let me hear from you.

I confess that I lose patience when I see the extravagant use of money by the Bell company. First, they advertise Independents as "failures." Second, they pay two or three prices for what they term "failures." What is the game anyway?

It is getting to be a byword among certain financial men, that they have made more real money out of telephone properties than any other venture.

The brewing element in the old Kansas City Home freely admits that it made more real money in the telephone venture than in the beer business.

Then I come to the next thought in the bulletin, a clipping from a Grand Rapids paper. This city is a peculiarly sensitive spot. In it there exists a most successful Independent telephone company.

There are nearly 4,000 stockholders there, and they have received an 8 per cent. dividend every year for fourteen years. This telephone company stands alone in its uniqueness. It has nearly a $4,000,000 common stock issue, no bonds and no preferred stock. It is a wonderful company indeed!

If there is any Grand Rapids newspaper that fails to see the beauty of the Citizens Telephone Co. from a general economic standpoint, someone is blind, because he wants to be.

This Grand Rapids paper says, "Law now renders that protection against extortion and arrogance which could only be secured through competition." In other words, this Grand Rapids paper is blind and silly enough to want a return to monopoly.

It does throw one mean little bouquet to the Independent telephone men: "The men who were responsible for the institution of Independent telephone systems in Michigan rendered a distinct public service that should not be forgotten."

Lovely, isn't it? Will they get monuments in the public square? Queer that the law did not accomplish this Utopia back in 1895.

Let us see how monopoly would affect Grand Rapids. It costs the Bell company $40 to furnish universal service and pay dividends. The Citizens Telephone Co. accomplishes this same result for $24.

If the Bell company is given Grand Rapids, the state Railway Commission cannot deny it the right to charge enough for service to give an investment return, otherwise numerous Bell lawyers will be there, speaking in low whispers about the thirteenth amendment.

Then you would hear a wail from the Grand Rapids Herald, crying for public-spirited citizens to put up good money to liberate Grand Rapids from extortion.

Today the Citizens Telephone Co. has undoubted supremacy in Grand Rapids and vicinity. Its 31,831 telephones give practically a universal system for that city. Not enough calls get beyond these telephones to make it worth while. And the financial performance is as follows:

Cost per telephone to Grand Rapids users	$24.11
Cost to telephone company	14.83
Return to Grand Rapids stockholders	$ 9.28

This net income is returned to the army of stockholders around the city, making the practical cost to the community around Grand Rapids, about $15 per telephone. It truly is a wonderful record!

Suppose the grand and universal Bell system gets into the game alone. First, it will deprive the community of $300,000 in annual dividends. Second, it will cost Grand Rapids much more money for telephone service.

Grand Rapids will pay $60 or $72 for a business telephone, and residences will pay $36, where they pay much less now. Grand Rapids newspapers do not know that Bell men will expect them to pay more for telephones because they are connected to a universal system.

On the same principle, rents should be higher in Chicago because we have eighteen-hour trains to New York.

Bell experts will prove to the state Railway Commission that Grand Rapids should pay Bell losses in other places. If the Grand Rapids Herald gets its dearest wish, the citizens of Grand Rapids will support a company like this:

Gross income	$40.00
Cost	30.00
Net	$10.00

And this $10 for over 30,000 telephones will be spent in New England, not Grand Rapids. Why pay out $30 to earn $10 when you can do it for $15?

You can't get away from it. Telephone service is purely a local matter and 97 per cent. of all the telephone business is done at home, while 3 per cent. of it is done away from home.

Grand Rapids pays $24.11 for 97 per cent. of telephone service possibility. Will it pay $40 for 3 per cent. more?—Or, practically, $500,000? It hardly seems credible!

If we ever have municipal telephones, it will be because a few misguided financiers have never been able to learn a few simple and economic aspects of telephone service.

Honestly, I get out of patience with some Bell publicity. It grabs at straws. It leans too much upon phantoms and departs too far from common sense.

The next gurgle in this news bulletin is from the St. Louis Republic. It gets off this beautiful gem: "A single telephone system, with its financing subject to public control, its books wide open to public inspection, and its rates regulated so that the business will pay a fair return on honest capitalization, solves the problem."

Say, did you ever see any Bell books open to the public? Did you ever see any company submit to regulation it did not like without appeal to higher courts?

The Republic had better pinch itself and get wide awake. The Kinloch Telephone Co. is the distinct success at St. Louis. Why not move that failure known as the Bell of Missouri? There never was such a fizzle as this concern. St. Louis can much more surely depend upon the Independent telephone company.

Another outburst comes from Omaha. This time it is the Omaha Bee. It speaks out right in meeting. And I want to record what the Bee says, because the Home company is done and monopoly has begun. Possibly the Bee may have to pay for telephone service, then there will be vigorous buzzing in the other direction.

"The termination of the receivership of the Home company by forced sale under court order is the consummation of a great crime against a whole community.

"Not that a judicial sale constitutes a crime, but the enterprise taken altogether from its inception, its acquisition of a valuable franchise to operate in Omaha by false representation, its blue-sky financing, its construction ring rake-off, marks a gigantic criminal conspiracy which has robbed hundreds and thousands of poor people of savings they could illy afford to lose, and saddled upon our city an absolutely unnecessary interest burden of several million dollars without any adequate return."

There is no doubt of the "blue-sky financing" and the "construction rake-off" but who dares to say that this does not exist today in almost every enterprise?

But I hope the Omaha Bee will not forget as the Des Moines papers did. Obeying a newspaper is a thankless job.

The final outburst comes from a St. Cloud paper, out in Minnesota. It seems that the Tri-State Telephone & Telegraph Co., of Minneapolis, wanted toll stations there. St. Cloud is a place which the Bell company has held at fearful cost. And of course one may be sure that there are no hostile newspapers.

Suppose a railroad wanted to reach St. Cloud. Franchises, bonuses and land galore would be literally hurled at the railroad. And when the rails of the new road reached St. Cloud, there would be fireworks, picnics and divers celebrations.

But when an identical service, a long distance telephone line wishes to enter, there is a difference. It always seems to be a human disposition to bite off one's nose to spite the face! This St. Cloud paper was surely trying to do it. Nevertheless the franchise has just been voted by the people—two to one.

Possibly I may be wrong after all these years of observation. I have always presumed that the telephone business is like any other, and subject to all laws of common sense.

Some people try to believe that Joe Smith or Moses received the early tablets of telephone commandments and gave it to New England. That very idea will eventually fool the financial interests who are now flying in the face of Providence.

Some day they will have to swallow the effects of much fool publicity—such publicity as the late story of the Chicago Tunnel and the purchase of the Inter-State company, of Aurora, Ill.

Those press joke-smiths do not realize that they are injuring the cause of private ownership of telephones.

As I see it, the Bell crowd is making practically its last effort to buy out competition. As long as the supply of licensee bonds holds out, it will have plenty of money. It seems to me that the voluminous issue of licensee bonds is fast making American Telephone stock look like a poor equity.

I have had hopes of something useful and sensible being

done toward ironing out complex telephone matters. But when I read such a foolish bulletin, I just about give up hope of private ownership.

The Vail letter is not being obeyed. I know of numerous places where its promises are being violated. But what good does it do to protest? Any protest will be met by excuses.

Public sentiment is a poor rock on which to build a monopoly foundation. Sentiment was once aroused by the need of telephone service and it can be aroused again.

Public sentiment is a shifting quicksand. It will ruin any institution that relies upon its promises. It demands one telephone where two exist, and two telephones where one exists.

In Heaven's name, will any financial institution be misled by such an apparition?

The telephone business comes nearer to human needs than any other business. It is the easiest to handle. Yet it offers the most complex problems to solve.

If the financial oligarchy wishes to succeed, let it pass along the word allowing local banks to approve of a local telephone security. Then local enterprises will pass their prosperity on to the larger city companies.

Personally, I would rejoice in the doubling of telephone rates. It would serve the public right.

I don't believe any economic law will justify the operation of a universal system. The line of increasing cost will cross the line of income, which the public will pay to the company. That is the real test.

I was in hopes our Bell contemporaries had quit chasing shadows. It seems that the information department has not.

MORAL: Financial interests should not believe in fairies!

Would Tax Iowa Bell in Des Moines.

The Des Moines, Iowa, city council has passed a resolution presented by Mayor James R. Hanna providing for a special tax of $1 per year for every telephone pole maintained by the Iowa Telephone Co., and $1 per mile for all underground wire.

The resolution further provided for the regulation of telephone rates in the city, so far as the city has power to exercise control. The city will claim one free telephone for each 1,000 population, or about ninety free telephones at the present time.

Mayor Hanna has been engaged for several months in investigating the telephone situation. His efforts to induce the Iowa Telephone Co. to apply for a franchise to do business in Des Moines have been without success. He has reached the conclusion that if the company will not declare its intentions regarding Des Moines, the city should take other measures to secure the privileges due it.

Owing to the taxing system, it is charged, the Iowa Telephone Co. does not pay into the treasury of the city of Des Moines an adequate return for the privilege of using its streets and other benefits. The mayor, therefore, has proposed the above taxing measure.

The resolution in full is as follows:

"Whereas, the Iowa Telephone Co. occupies streets and alleys of the city of Des Moines, with several thousand poles for the support of wires and with a system of underground conduits and wires; and,

Whereas, the tax which the said company pays on its property within the city makes no adequate compensation for this privilege in addition to the other benefits which it receives from the city; therefore,

Be is resolved, by the city council of the city of Des Moines that the legal department be directed to prepare an ordinance providing for the regulation of the setting of telephone poles, and the stretching of telephone wires, and for the laying of conduits, and, providing for an annual rental tax of $1 per pole, and $1 for each mile of underground wire, and providing also that any telephone company operating in the city of Des Moines shall in addition to said rental furnish to the city of Des Moines, without other compensation than the privilege of occupying streets and alleys with poles, wires and conduits, one telephone for each 1,000 population, and reserving the right to the city to repeal said ordinance at its pleasure; and,

Be it further resolved, that the ordinance, in so far as the law permits, provide rates which telephone companies may charge in the city."

The legal phase of the recommendations made have not been reported upon.

Officers of Grand Rapids Citizens.

The officers and directors of the Citizens Telephone Co., of Grand Rapids, Mich., elected at the recent annual meeting, are as follows: Chas. F. Rood, president; Robert D. Graham, vice-president; E. B. Fisher, secretary; Wm. J. Stewart, treasurer; Philip Graham, C. E. Perkins, P. B. Garvey, L. J. Rindge, John B. Martin, Gaius W. Perkins, Van A. Wallin.

The executive committee is composed of Messrs. Graham, Perkins, Stewart, Rood and Fisher. C. E. Tarte is general manager.

Says Detroit Merger is Accomplished.

James Murfin, of Detroit, Mich., general counsel for the Michigan State Telephone Co. has stated publicly that the amalgamation of the Bell and the Home companies, in Detroit, has been consummated, the mortgages filed and possession taken, despite the temporary injunction which a stockholder in the Home company secured in the Ingham circuit court a short time ago.

Mr. Murfin stated that no copy of the injunction was ever served on the Bell company and, as the only notice the corporation had of the legal proceedings was that published in the newspapers, no reason was known for delaying further the plans for the combination.

Commissioner Hemans, of the Railroad Commission, says that the commission has never been officially apprised of any injunction, although it is required that the commission be served with a copy in proceedings of that character.

It is understood that the Grass Lake company will carry its application for an injunction to the supreme court.

Louisville Home Regular Dividend.

The Louisville (Ky.) Home Telephone Co. has declared the regular quarterly dividend of 1½ per cent., payable October 1. The books closed September 25 and reopen October 3.

Preparing to Build Jacksonville, Fla.

A bond in the sum of $50,000 has been filed by A. S. Metzner and his associates of Jacksonville, Fla., to insure for the faithful performance of their obligations to the city under the ordinance recently passed by the city council and ratified by the voters, granting a franchise.

One of the promoters of the new enterprise says that the work of installation will begin almost immediately and that the Independent system will be in operation within a few weeks. Stock in the new company will be placed on the market immediately.

Impedance of Receivers as Affected by Diaphragm Motion

Abstract of Paper Read at the Dundee, Scotland, Meeting of the British Association—Resistance and Inductance of Telephone Receivers at Various Frequencies with Diaphragms Damped and Free—Examination of Theory Shows Some Interesting Relations

By A. E. Kennelly and G. W. Pierce

The authors undertook to measure the resistance R, inductance L, reactance $L\omega$, and impedance $Z=R+\jmath L\omega$, of various telephone receivers, over a wide range of frequencies ($f=\frac{\omega}{2\pi}$ cycles per second), in order to study the effect of change of frequency on the above-mentioned quantities.

The measuring apparatus used consisted of a Rayleigh modification of the Wheatstone bridge. The two ratio-arms AD and DC of the bridge were of non-inductive resistance, of 5 ohms each. The telephone receiver T, under test constituted a third arm. In the fourth arm was inserted in series an adjustable non-inductive resistance, and an adjustable Ayrton-Perry inductance variometer L. In place of the bridge galvanometer was a pair of head telephones H, by which a silence balance could be determined.

The source of alternating current was a Vreeland oscillator V, supplied from 118-volt continuous-current mains. The alternating currents supplied to the bridge from the oscillator were very nearly sinusoidal, and of very nearly uniform frequency, which frequency was capable of being adjusted to any desired value between 430 and 2,400 cycles per second, by adjusting the capacity or inductance of the oscillator primary circuit.

A non-inductive resistance R between the oscillator and the Rayleigh bridge, enabled the current supplied to the bridge to be controlled and computed. Calling e_t the voltage at telephone terminals and e_s the voltage at the Vreeland secondary terminals, the conditions for balance, very nearly gave:

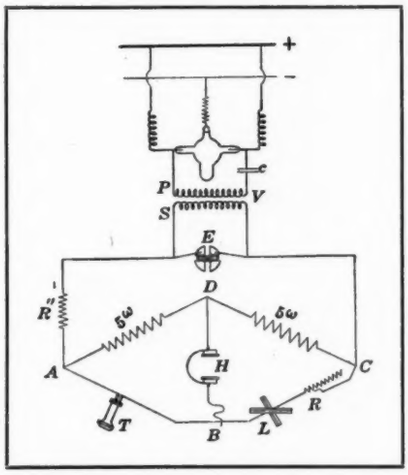
$$e_t = e_s \frac{5}{R'' + 10} \quad \text{volts}$$

and this voltage e_t remained constant throughout each series of tests. In different series of tests, e_t varied from 0.3 volt to 1 volt.

It was found that at or near the fundamental frequency of the receiver diaphragm, the measured values of resistance and inductance in the receiver varied considerably, according to whether the diaphragm was prevented from vibrating, *i. e.*, "damped" (usually by pressing the finger on its center), or was set "free" to vibrate. The difference between the measurements with diaphragm damped and diaphragm free, was due to the emf induced in the receiver windings by the motion of the diaphragm, on the principle of a reciprocating alternating current motor. Consequently, the measurements were all made under two successive conditions, "damped" and "free." The damped values of resistance, inductance, reactance, impedance and power, represent the normal values in the quiescent state; while the free values, corresponding thereto, represent the damped values as modified by the electrodynamic action of the diaphragm.

Considering first the "damped" values only, it was found, as was already well known, that the resistance of a receiver increased with the frequency, while the inductance diminished. In the case of the receivers tested, which were typical standard instruments, it was found that over a considerable range of frequency the inductance diminished, as the resistance increased, proportionately; or, that the product of resistance and inductance remained very nearly constant—a relation that does not appear to have been noticed. It was also found that the resistance conformed to a simple quadratic function of the frequency; that is, it consists of a constant term—the resistance to continuous currents—plus a term proportional to the frequency, minus a term proportional to the square of the frequency.

Considering the "free" values, it was found that when the impressed frequency was near the lower limit of 430 cycles,



The Rayleigh Bridge and Connections.

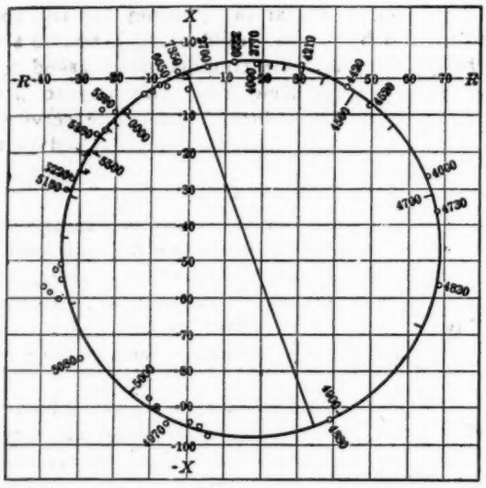
and also when it was near the upper limit of 2,400 cycles, the free values differed inappreciably from the damped values. In other words, pressing the finger lightly on the diaphragm made no appreciable change in the measured resistance or inductance. As, however, the impressed frequency approached the natural fundamental frequency of the diaphragm, the diaphragm began to vibrate perceptibly, emitting a loud note, and the free values began to differ markedly from the damped values. In the neighborhood of resonance, the free values passed through sudden fluctuations of resistance and inductance, with sharp maxima or minima; whereas the corresponding damped values showed no fluctuations, as the frequency was increased.

The power absorbed by the receiver when free, as compared with that absorbed when damped, also reaches a sharp maximum in the neighborhood of resonance. If the vector impedance of a receiver is plotted to resistance abscissæ and resistance ordinates through a series of increasing frequencies, the damped values pursue a smooth curve, but the free values follow a closed loop in the neighborhood of resonance; so that at two widely different frequencies, the free impedance may be one and the same vector quantity, although the damped impedances may lies separated by a considerable distance.

If the damped values are subtracted from the free values of resistance, inductance, or their dependent quantities at the same frequency, the differences are vector quantities which may be called the "motional impedances" since they are the changes of vector impedance effected by motion of the diaphragm for the particular frequency and terminal voltage considered. The motional resistances and reactances of a receiver, when plotted independently as ordinates against frequencies as abscissas, go through certain characteristic sharp fluctuations in the neighborhood of resonance which are very instructive, and which bear marked resemblances to correspond-

ing curves of the optical index of refraction, and optical absorption, in an absorbent optical medium in the neighborhood of an absorption band.

If the motional impedance of a receiver is plotted vectorially, it is found that as the impressed frequency increases, the graph pursues a circular locus, passing nearly through the



Circular Graph for Bipolar Receiver with 0.3 Volt at Terminals.

origin of co-ordinates; that is, if the motional resistance is plotted along the axis of abscissæ, and the corresponding motional reactance along the axis of ordinates, the points representing successive frequencies pass through a circle. At a very low frequency the motional impedance is practically zero, or the point nearly coincides with the origin of co-ordinates. As the impressed frequency approaches the natural period of the diaphragm, the motional impedance increases in modulus, while advancing clockwise. At resonance, the motional impedance coincides with the principal diameter of the circle. At super-resonant frequencies the motional impedance dwindles again, and at very high frequencies practically disappears.

This new and interesting vector phenomenon is illustrated in the figure for the particular case of a standard form of Bell bipolar telephone receiver with 0.3 volt at terminals. The small circles indicate the observations at successive frequencies and the numbers attached to them are the angular velocities, ω, in radious pertaining thereto. Thus, it will be observed that at an angular velocity, ω, of 4,730 radians per second (f=754 cycles) the motional resistance is +67 ohms and the motional reactance —36.3 ohms; whereas, at 4,880 radians per second (f= 778 cycles) the motional resistance is +39 ohms and the motional reactance —93.3 ohms. The large black circle conforms satisfactorily to the observations, and is the circular graph of motional impedance, for this particular instrument, and terminal voltage. The radial scale of numbers attached to the inner rim of the circular graph show computed values of the angular velocities arranged for comparison. The principal diameter intersects the graph at or near an angular velocity of 4,885 radians per second (779 cycles), and is the resonant frequency, or natural vibration frequency of the diaphragm, in this instrument. The angle of dip of the principal diameter is twice the angle of lag of magnetic flux in the receiver magnets behind the alternating current through its coils.

The first approximation theory of the phenomenon has been worked out, and shows that the graph of motional impedance in a receiver, at constant terminal voltage, should be a circle, when the impressed frequency is varied. The theory reveals a number of interesting relations. Thus, the magnitude of the motional impedance graph diameter, *i. e.*, the size of the circle, does not depend upon the natural pitch of the diaphragm; nor does the angle of dip of the principal diameter. These quantities are determined by the electric and magnetic constants of the instrument. On the other hand, the value of impressed frequency at the free end of the principal diameter is determined solely by the mechanical constants of the diaphragm, *i. e.*, by its natural vibration frequency. Again, the spacing of the frequencies around the circle, with respect to the natural or diametral frequencies, is determined solely by the mechanical damping factor of the diaphragm.

A heavily damped diaphragm will crowd the successive decades in ω together; whereas a lightly damped diaphragm, of prolonged resonance, spreads them apart. The log. decrement per second of the damping, belonging to the diaphragm, can be read off the circular graph by inspection. In the case of the figure, it is approximately 200; that is, if the diaphragm is set in vibration and allowed to come to rest without electromagnetic interference, its vibration amplitude will fall to $1/\varepsilon$ th or to $0.3678 = 36.8$ per cent., in an interval of time amounting to the two-hundredth part of one second.

The diameter of the circular graph has been found to be as much as 185 ohms in one case. In very weak instruments it may become so small as to be inappreciable. The dip angle of the principal diameter has been found to range from 21.5 deg. in the case of an experimental monopolar instrument, to 93 deg. in the case of a "watch case" bipolar. Each receiver, or type of receiver, has its characteristic circular graph, from which many of its electric and mechanical constants can be deduced.

The summary of results and conclusions given in the paper are:

1. The resistance and inductance of several telephone receivers were measured over a wide range of frequencies, with their diaphragms both free and damped.

2. In two typical forms of receiver the damped resistance was found to be a quadratic function of the frequency.

3. Although the damped resistance and the damped inductance both vary with the frequency, their product was found to be a constant, independent of the frequency, over a considerable portion of the range of audible frequencies.

4. The free resistance and reactance of a receiver go through marked changes with changes of impressed frequency in the neighborhood of the natural fundamental frequency of its diaphragm.

5. The motional resistance and motional reactance—that is, the excess of free over damped resistance or reactance—conform accurately to certain simple laws, thus:

I. The motional reactances plotted as ordinates against the motional resistances as abscissas as the frequency of constant impressed emf is changed from zero to infinity give a circular locus, with various interesting characteristics, for which a first approximation theory is given.

II. The rectangular plots of motional reactance and motional resistance, against angular velocity of constant impressed emf, give curves somewhat analogous to the curves of index of refraction and absorption of light in an optical medium in the neighborhood of an absorption band.

6. The power taken by a telephone receiver when sounding at 0.3 volt applied voltage may exceed by 68 per cent. the power taken from the same emf when the diaphragm is damped.

New Telephone Exchanges in London.

According to an official statement of British post office, six new telephone exchanges are contemplated for London in the near future. Three of them will be known as the Park, Regent, and Museum exchanges, two of the other three being in the city and one in the Clerkenwell district. The Park exchange will be in the Notting Hill neighborhood, the Regent exchange is extended to relieve Gerrard, whilst the Museum exchange will assist the Holborn, Central, Gerrard, and Mayfair exchanges. It is expected that the Park exchange will be opened shortly.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities, and Actions of City Councils Bearing Upon Franchises, Rates and Service

Upholds Commission's Rate Regulating Power.

In an opinion by Chief Justice Turner, just handed down in the Oklahoma supreme court an Oklahoma City ordinance authorizing the Pioneer Telephone & Telegraph Co. to raise its rates on the basis of additional subscribers, the maximum rate to be charged to be dependent upon the total number of telephones within the city limits, is declared void, while the right of the Corporation Commission to establish rates for telephone companies is upheld.

Under an order of the corporation commission which provides that no telephone or transmission company shall make a change in rates without first submitting the proposed new schedule to the commission for approval, the Pioneer company was fined $100 for violation of the order. The judgment of the commission is affirmed.

The decision is of especial importance in Oklahoma City, as the company was required by James S. Twyford, who was city attorney at the time, to give bond to reimburse its subscribers for the additional amounts to about 25 per cent. of all charges collected from subscribers in Oklahoma City since April, 1909. Mr. Twyford will take up the matter with the present city administration to assist in securing this refund for the subscribers. The refund will aggregate about $60,000.

When the company made its raise in 1909, its authority to do so was questioned by Mr. Twyford and after considerable sparring back and forth he took the matter before the corporation commission on a complaint signed by the Burroughs Oil Co.

The decision applies also to Guthrie and other cities in which the Pioneer telephone people operate. There will be no rebate in Guthrie for excess was not charged.

Tri-State Granted St. Cloud Franchise.

By a popular vote of about two to one, the Tri-State Telephone & Telegraph Co., of Minneapolis and St. Paul, has been granted a franchise at St. Cloud, Minn. The grant permits the installation of twelve toll stations throughout the town, which will connect with the long distance lines of the Tri-State company. It does not include the establishment of a local exchange. The work of running the lines to St. Cloud will be begun at once.

Previous to submitting the question to the voters, the city commission had approved the franchise, four commissioners voting in favor of it and but one against it.

Refusal to Furnish Service.

The Metropolitan Telephone & Telegraph Co. has complained to the New York Public Service Commission against the New York Telephone Co. for refusal of the latter to furnish telephone service to the complainant.

The petition states that it is a telephone corporation within the contemplation of the Public Service Commisson law. On August 6, 1912, application was made to the New York Telephone Co., for telephone service, involving the placing of a switchboard in the office of complainant. The contract was signed on August 9 and a check given the New York company. On August 22, after repeated requests for service, the complainant's check was returned and the contract sent back with complainant's name cut off.

Complainants say they requested that a letter be written by the New York company giving the reasons for declining to furnish service, and that the attorney for the company promised that such a letter would be sent, but no such letter has been received. The commission is asked to make an order directing the New York company to promptly install a switchboard and furnish telephone service. The complaint has been served on the company and an answer required within ten days.

Speculation on Bemis Report in Chicago.

The possibility of a reduction in the rates of the Chicago Telephone Co., in Chicago is said to be remote. This, it is maintained in some quarters, will be the report of Professor Edward W. Bemis, public utility expert, who has been busy for a year on a telephone report at the instance of the city council.

An official of the company said: "I am informed that there will be a suggestion of reduction on unlimited residence service. This I do not consider a real reduction, but simply the placing of a premium on those subscribers. In other words, it will encourage that service."

Professor Bemis refused absolutely to affirm or deny the information. He said the report would be ready "speedily," but when asked to set a definite date he declined.

Orders Bill Revoking Bell Franchise.

The Central Union Telephone Co. is to be ordered to cease doing business in Peoria, Ill., because of alleged poor service, excessive rates and failure to comply with franchise conditions.

A resolution asking the draft of an ordinance to this effect has passed the city council by a vote of eleven to four. The resolution requires the corporation counsel to draw an ordinance repealing the franchise under which the Central Union company is operating.

The recommendations of the committee set forth in detail the reasons why the franchise should be nullified. In brief the telephone company had not acted promptly in the matter of painting poles when so instructed; it had not proven that its rates were not excessive, and it had not remedied its "miserable service."

The following editorial from the Peoria Herald-Transcript needs no comment:

"There is no desire among the intelligent citizens of Peoria to prosecute any public service corporation doing business in this city, and the most of us have learned that it is no crime for a concern of this sort to make a reasonable amount of money out of its investment. But when it becomes apparent that such a corporation is not only granting to its patrons a poorer quality of service, while at the same time demanding more compensation than it is giving and receiving in other cities of similar size, civic self-respect and a sense of fair play demand that the imposition be ended.

For this reason the action of a certain faction of the city council demanding the repeal of the Central Union Telephone Company's franchise will meet with the approval of a great majority of Peoria citizens. There is no desire to put the Central Union out of business; the backers of the repeal resolution simply desire to place the company in a position where it will have to comply more fully with the terms of its franchise and give the patrons of its Peoria lines the same service at the same rates charged in other cities of similar size. The committee of aldermen who have investigated the matter of rates in other cities make this report:

From the best information we can find, your committee is of the opinion that the rates at present charged

in the city of Peoria are excessive and not in accordance with that portion of the ordinance last mentioned (providing that rates shall not exceed those charged in cities of like size or population).'

It is not necessary to go outside of Peoria to find that the Central Union is making an extra profit off its local patrons. The fact that its Independent rival is able to make a profit at rates considerably under those of the Central Union is evidence enough on this subject.

The council will have the backing of the general public in standing by the Lowes resolution. We are entitled to better telephone service and lower rates."

Denver Mayor Vetoes Competition Invitation.

A resolution passed by the Denver, Colo., city council, inviting the entrance of a competing telephone company in that city, has been vetoed by the mayor. Among the reasons which he gave for the action were that it would be better to give the Mountain States Bell an opportunity to deal fairly with the people before taking steps to obtain relief through competition.

Decision Affecting Oklahoma Franchise Grants.

The right of a municipality to grant a franchise to an individual is defined in an opinion by Chief Justice Turner, of the Oklahoma supreme court, in affirming the judgment of the district court of Washington county in holding void a franchise granted by the city of Bartlesville, to Robert L. Henry, to lay gas mains in the streets of Bartlesville.

Under an ordinance granted by the city of Bartlesville, a franchise was granted to Henry and his assigns, to lay pipes and supply the people of the town of Bartlesville with gas for a period of twenty years. On the ground that the franchise was void, an injunction was granted, restraining the holders of the franchise from digging up the streets. In his opinion Justice Turner says:

"The legislative power of the state has never granted or delegated to the municipalities of the state the power to grant to an individual the franchise of furnishing natural gas to such municipality, or clothed him with the power of exercising the right of eminent domain to enable him to do so. This business of a public nature has been provided for by the state and by it entrusted to domestic corporations only."

Would Appeal to Commission on Rates.

An appeal to the Wisconsin Railroad Commission for a reduction of rental rates by the local exchange of the Wisconsin Telephone Co. is proposed by the mayor of Manitowoc, Wis., who, in a statement to the council analyzing the annual report of the telephone company filed at Madison, declared that the exchange was making 20 per cent. on its investment, or 13 per cent. more than a reasonable dividend which the commission had prescribed.

The figures of the report show that the company had a surplus of $17,000 in the local exchange, but of this amount, $6,067 is deducted for depreciation. The mayor attacked the figures, which he said had been juggled.

Nebraska Commission Rulings.

The Nebraska Railway Commission has decided to bring in the aid of the state's legal department in obtaining physical valuation of several telephone companies of the state which thus far have failed to comply with the commission's request. The delinquent companies are: Archer Independent Telephone Association, Boyd County Mutual Telephone Co., Grant Telephone Co., Hastings Independent Telephone Co., Wilson Telephone Co., Stella Telephone Co., and Jackson Independent Telephone Co.

Permission has been given the Farmers' Telephone Co., of Dodge county, and the Citizens' Telephone Co., of Saunders county, to connect with a toll line extending from the switchboard of one company at North Bend to the switchboard of the other company at Morse Bluffs and to establish toll rates to several towns in the two counties.

The Lincoln Telephone & Telegraph Co. has been allowed to discontinue its exchange at Friend. All of the subscribers except five had been taken over by the Saline County Telephone Co., and these five will go over to the other company without objection. Consequently the free service between Cordova and Exeter with the Lincoln company's exchange at Friend has been discontinued.

Seeks Franchise in Rock Island.

The Tri-City Automatic Home Telephone Co. has filed a petition with the city commission of Rock Island, Ill., asking that a proposition to grant the company a franchise be passed upon by the voters of the city. The franchise proposed is for twenty-five years, construction must be commenced within ninety days after franchises are granted by Rock Island, Moline and Davenport and service must be furnished within eighteen months after beginning work. Lines within fire limits are to be placed under ground.

It is specified that the company shall furnish free service until such time as it has 12,000 telephones in service in the three cities and their suburbs. Rates are fixed as follows: $4.50 a month for business service and $2 a month for residence service, with an increase of 16 2-3 cents a month for each 1,000 additional telephones; party lines, $3 a month for business service and $1.50 a month for residence service.

Free service is to be furnished to Rock Island, Sears, Milan, East Moline, Silvis, Watertown, Moline, Davenport and Bettendorff and suburbs within a ten mile radius of the exchanges of the three cities. The city is to receive fifteen telephones free and fifty for the fire and police systems.

Authorizes Sale of Telephone Property in Ohio.

The Ohio Public Service Commission, after considering the application of the Adams County Telephone Co. and the Manchester Telephone Co. for permission for the latter to buy certain property from the Adams County company, has authorized the sale. The property in question is located in or near Manchester. The consideration is $493.93.

New Jersey Commissioners on Discrimination.

The Board of Public Utility Commissioners, of New Jersey, has just published a report made to it some time ago by Philander Betts, chief inspector of the utilities division, on the matter of discrimination in rates practiced by the various telephone companies doing business in that state. The report was, in part, as follows:

"In August, 1910, the board directed the telephone companies doing business within the state of New Jersey to file complete schedules showing the rates charged for all classes of service. The companies were also directed to file lists showing the customers receiving service at other than scheduled rates, and information as to whether these special rates were the subject of special contracts or not.

The telephone companies filed the information called for, and this has been studied critically with a view to determine to what extent service was being furnished at rates other than standard—the standard rates for the purpose of this inquiry being considered the regularly advertised schedule. Some critical study has also been made of the schedules themselves to determine whether the schedules in themselves provide for undue discrimination.

The telephone companies appear to be divided into three general groups: The Bell system, with the New York Telephone Co. in the northern part of the state and the Delaware & Atlantic Telegraph & Telephone Co. in the southern part of the state, together with the affiliated or sub-license companies; those connected with the Independent or Keystone system of Pennsylvania, which include the Interstate, the Eastern, the Peoples Rural and a

(*Continued on page 480.*)

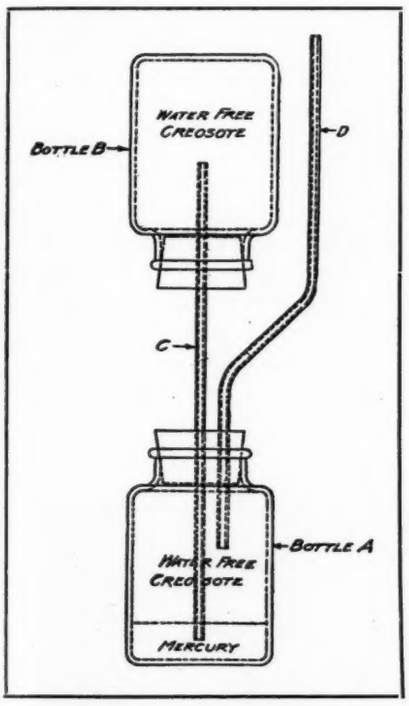
The Absorption of Creosote by the Cell Walls of Wood

A Report Issued by the United States Forest Service, Department of Agriculture—Effect of Absorption by Cell Walls—Past and Present Investigations—Methods of Test—Treatments with Creosote Free from Water—Results of the Tests

By Clyde H. Teesdale

The location of the creosote absorbed by wood in preservative treatment has much to do with the mechanical properties of the treated material. If the cell walls do not absorb creosote, wood properly treated should not suffer a decrease in strength, provided no chemical reaction takes place. If, on the other hand, the cell walls do absorb creosote, then a weakening effect, similar to that produced by moisture in the wood, may be expected.

Miscroscopic examinations of creosoted wood made by the forest service in the past, led to the belief that creosote did not enter the cell walls. Later experiments, however, apparently showed this supposition to be incorrect. Creosote oil, seen in a mass, appears of a dark or almost black color, but in a thin layer is transparent and almost colorless. Failure to see it in a section of wood mounted for miscroscopical examination, therefore is no proof of its absence, and evidence must be sought for by other methods.



Arrangement of Apparatus.

It is well known that the volume of wood varies with the amount of moisture present, increasing with the absorption of water by the cell walls, and shrinking with drying.* It is therefore reasonable to suppose that if creosote is absorbed by the cell walls an effect analogous to that produced by the absorption of water will occur.

Measurements by Harry D. Tiemann, of the forest service, made at the Yale Forest School laboratory on test specimens before and after soaking in creosote (see Table No. 1,) indicated a slight but unmistakable swelling in the specimens thus treated. The results of another series having a similar purpose, but differing materially in the methods employed, made recently at the Forest Products Laboratory, are given in this circular.

In these tests a number of pieces approximately 2"x¾"x⅛" were prepared from yew (*Taxus*) and Eastern hemlock (*Tsuga canadensis*). The pieces were dried in an oven at 212° F. for 24 hours, then placed in a desiccator and weighed when cold to the nearest 0.001 gram, after which they were coated with paraffin and again weighed in air and also under water.

The weight of each piece under water was corrected by subtracting the weight (under water) of the paraffin on the piece.† The volume of each piece was found by subtracting its weight under water (corrected) from its weight in air, the weight of the water displaced, in grams, being numerically equal to the volume in cubic centimeters.

Measurements.	Species.				
	Spruce.	Chestnut.	Longleaf pine.	Loblolly pine.	White oak.
Dec. 5, 1908:					
Weight.....grams..	7.400	8.240	9.290	7.010	9.540
Radial dimension.....inches..	1.989	1.976	1.973	1.985	1.967
Tangential dimension.....do...	1.965	1.952	1.470	1.479	1.466
Dec. 7, 1908:					
Weight.....grams..	12.500	12.650	10.550	11.500	10.680
Radial dimension.....inches..	1.989	1.979	1.975	1.988	1.968
Swelling.....per cent..	0	.150	.100	.150	.050
Tangential dimension.....inches..	1.968	1.956	1.473	1.481	1.467
Swelling.....per cent..	.150	.200	.200	.140	.070
Dec. 14, 1908:					
Weight.....grams..	14.000	13.580	10.970	12.170	10.980
Radial dimension.....inches..	1.991	1.980	1.976	1.988	1.968
Swelling.....per cent..	.100	.200	.150	.150	.050
Tangential dimension.....inches..	1.968	1.956	1.473	1.481	1.469
Swelling.....per cent..	.150	.200	.200	.140	.200
Apr. 10, 1909:					
Weight.....grams..	18.800	17.400	13.900	15.200	12.750
Radial dimension.....inches..	1.993	1.991	1.995	2.002	1.995
Swelling.....per cent..	.200	.760	1.110	.860	1.420
Tangential dimension.....inches..	2.004	1.989	1.491	1.496	1.501
Swelling.....per cent..	1.980	1.900	1.430	1.160	2.390
Sept. 9, 1909:					
Weight.....grams..	18.850	17.500	14.050	15.200	13.100
Radial dimension.....inches..	2.097	1.993	2.001	2.003	1.999
Swelling.....per cent..	.000	.860	1.420	.910	1.630
Tangential dimension.....incher..	2.000	1.992	1.496	1.499	1.507
Swelling.....per-cent..	1.780	2.050	1.770	1.350	2.800
Sept. 10, 1909 (after heating 100° C. five hours and cooling in vacuum):					
Weight.....grams..	19.100	17.700	14.150	15.300	13.300
Radial dimension.....inches..	2.008	1.997	2.006	2.006	2.011
Swelling.....per cent..	.950	1.060	1.670	1.060	2.240
Tangential dimension.....inches..	2.002	2.000	1.501	1.503	1.526
Swelling.....per cent..	1.880	2.400	2.110	1.620	4.100

[1] The disks measured were cut from thoroughly air-dry wood (used in preference to oven-dry wood to avoid any possible subsequent absorption of moisture from the air) and were placed in a quart preserving jar containing creosote and sealed so that no additional dampness could enter. The creosote had previously been dried, and only partially filled the jar. The disks were 0.125 inch thick when placed in the jar Dec. 5, 1908. They were kept at about 17° C. until finally heated to 100° C. for about 5 hours with the cover of the jar loose, then cooled under seal so as to be in partial vacuum.

Table No. 1. Swelling of Wood Due to Absorption of Creosote.

The pieces were treated with creosote for 1½ hours at 180° F. and 150 pounds pressure per square inch. The creosote was then heated to 220° F., and the pieces allowed to remain in it at this temperature for 5 hours, after which they were cooled in the oil. The amount of water in the creosote was not determined, but was probably less than 0.5 per cent.

When the oil had reached room temperature (about 75° F.) the pieces were removed, the surplus oil on the surface was carefully wiped off, and the pieces were again weighed in air and in water and their volume determined as described before. The paraffin applied to the pieces before treatment was dissolved during the treatment. It was not necessary to coat the treated pieces with paraffin because the creosote made them sufficiently waterproof.

Since there was a trace of water in the creosote used, a second test was made with creosote from which the water had been removed. About one liter of creosote containing 0.2

* It is the water absorbed by the cell walls which causes swelling, not the free water in the cells, since after the fiber saturation point is reached water is still absorbed as free water, but no further swelling occurs. See forest service circular 108

† The weight of the paraffin was determined as follows: Let P = weight in air of paraffin on piece (in grams), and p = weight under water of paraffin on piece (in grams). Then $p = P -$ weight of water displaced. Also specific gravity $= \frac{P}{\text{weight of water displaced}} = 0.89$. Or, eight of water displaced $= \frac{P.}{0.89}$. Hence, $p = P - \frac{P.}{0.89} = P - 1.12P = -0.12P$.

per cent. water as alloed to stand over one pound of fused calcium chloride for 24 hours. Both the creosote and calcium chloride were well shaken at intervals. At the end of this period the oil was filtered.

In this test hard maple, dried for 24 hours at 102° C., was used. The pieces, of approximately the same size as those

Species.	No.	Oven-dry weight of piece.	Weight of paraffin.	Corrected weight of piece in water.	Weight after treatment.	Absorption of creosote.	Weight in water after treatment.	Volume before treatment.	Volume after treatment.	Increase in volume.	Increase in volume.
		Grams.	*Gram.*	*Grams.*	*Grams.*	*Gram per c.c.*[1]	*Gram.*	*c. c.*	*c. c.*	*c. c.*	*Per ct.*
Yew, heart[2]	1	2.288	0.034	−1.573	5.087	0.725	0.812	3.861	4.102	0.241	6.24
	2	2.047	.055	−1.385	4.562	.733	.705	3.432	3.644	.212	6.18
	3	1.808	.044	−1.289	3.845	.657	.359	3.097	3.308	.211	6.82
	4	2.147	.064	−1.463	4.840	.742	.747	3.630	3.863	.233	6.30
	6	1.666	.108	−1.041	3.643	.722	.548	2.707	2.899	.192	7.11
	7	2.179	.084	−1.319	4.682	.715	.751	3.499	3.732	.233	6.67
	8	1.728	.101	−1.044	3.822	.755	.580	2.773	3.004	.231	8.33
Average											6.81
Yew, sap	9	.967	.063	− .749	2.405	.837	.307	1.717	1.913	.196	11.4
	10	1.140	.113	− .775	2.720	.825	.385	1.915	2.107	.192	10.0
Average											10.7
Hemlock, heart	11	1.158	.109	−1.036	2.844	.769	.273	2.194	2.357	.163	7.44
	12	1.330	.092	−1.487	3.516	.812	.344	2.317	3.009	.192	6.75
	13	1.481	.104	−1.419	3.750	.782	.302	2.901	3.130	.229	7.90
	14	1.373	.112	−1.849	4.102	.847	284	3.223	3.452	.229	7.12
Average											7.30

[1] Based on volume of wood before treatment. [2] Piece No. 5 was lost during the tests.

Table No. 2. Weights and Volumes of Test Pieces.

used in the previous test, were placed in an 8-ounce bottle, *B*, shown in the illustration, the bottle and also the tube, *C*, being filled with the water-free creosote. A second 4-ounce bottle *A*, was filled to a depth of one-half inch with mercury, and the remaining space with water-free creosote. The glass tube, *C*, connecting the two bottles, dipped one-fourth inch beneath the surface of the mercury in the 4-ounce bottle. A second open glass tube, *D*, led from the 4-ounce bottle to the outside

This apparatus was placed in the treating cylinder, and a pressure of 250 pounds at a temperature of from 150° F. to 200° F. was applied for one hour. A gradually rising temperature was maintained throughout the treatment in order to guard against outside oil being drawn into the apparatus. The mercury seal was provided as an additional precaution against anything but mercury being drawn into the 8-ounce bottle *B*. With this apparatus, the outside pressure medium might have been creosote or any other liquid, but the pieces could have been treated only with the creosote which had been placed in the bottle.

The volumes of the hard maple pieces before and after treatment with the water-free creosote were determined as described for yew and hemlock.

Table No. 1 gives the measurements made at the Yale laboratory on one specimen each of spruce, chestnut, longleaf pine, loblolly pine, and white oak. Table No. 2 gives

Species.	No.	Oven-dry weight of piece.	Weight of paraffin.	Corrected weight of piece in water.	Weight after treatment.	Absorption of creosote.	Weight in water after treatment.	Volume before treatment.	Volume after treatment.	Increase in volume.	Increase in volume.
		Grams.	*Gram.*	*Grams.*	*Grams.*	*Gram per c.c.*[1]	*Gram.*	*c. c.*	*c. c.*	*c. c.*	*Per ct.*
Maple, heart	1	2.434	0.127	−1.112	4.095	0.456	0.149	3.649	3.947	0.301	8.26
	2	2.470	.160	−1.160	4.307	.506	.370	3.630	3.937	.307	8.46
	3	2.050	.143	− .982	3.608	.514	.291	3.032	3.317	.285	9.45
	4	2.145	.140	−1.009	3.755	.510	.338	3.154	3.417	.263	8.34
	5	2.044	.130	−1.024	3.588	.503	.270	2.068	2.309	.241	7.86
	6	2.141	.102	−1.162	3.800	.512	.324	3.243	3.476	.233	7.18
	7	2.381	.107	−1.164	4.168	.504	.336	3.265	3.532	.267	8.10
	8	2.310	.135	−1.138	4.057	.507	.350	3.448	3.707	.259	7.50
Average											8.14

[1] Based on volume of wood before treatment.

Table No. 3. Weights and Volumes of Maple Test Pieces.

results of the tests on yew and hemlock, and Table No. 3 of those on hard maple.

The average increases in volume resulting from the treatments of the three species in per cent. of the volumes before treatment were:

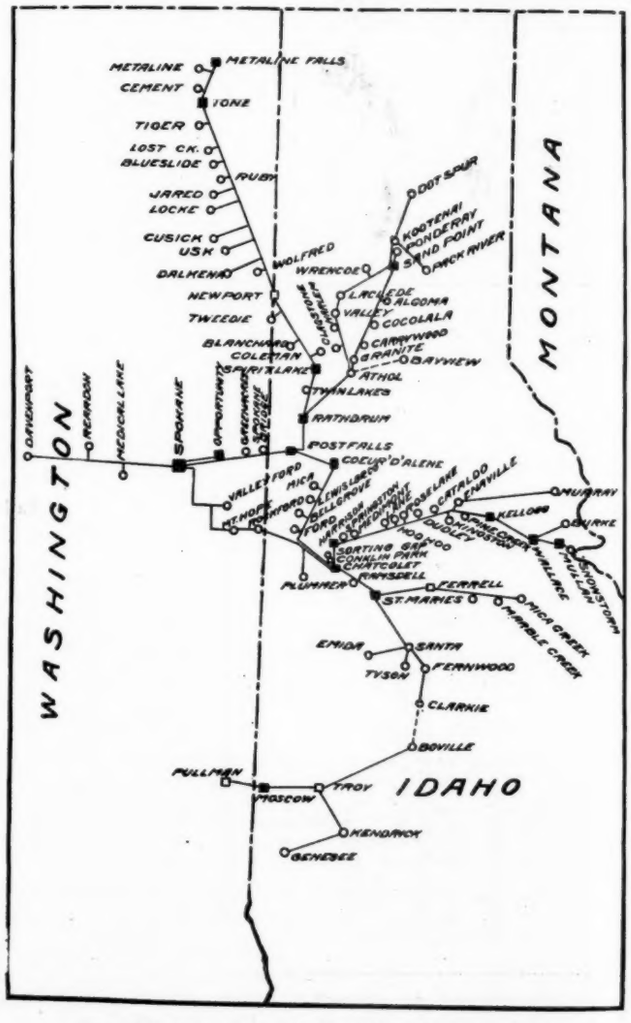
	Per cent.
Yew, heartwood	6.81
Yew, sapwood	10.70
Hemlock, heartwood	7.30
Hard maple, heartwood	8.14

It is thus seen that a decided swelling takes place in wood impregnated with creosote. This swelling, the tests indicate, is caused by the absorption of the creosote by the cell walls.

Spokane Home Company's Toll Range.

The current issue of the Automatic Telephone News, published by the Home Telephone Co., of Spokane, Wash., shows a map of the points about Spokane reached by the toll and long distance lines of the Home company and its affiliated organizations.

Commenting on the range enjoyed by the Spokane subscribers of the Independent system, Byron E. Cooney, editor of the News, says: "One of the first impressions to eradicate in the minds of the public is that the Independent telephone



Map Showing Toll Points Adjacent to Spokane.

has not the same facilities for long distance as those possessed by the Bell company."

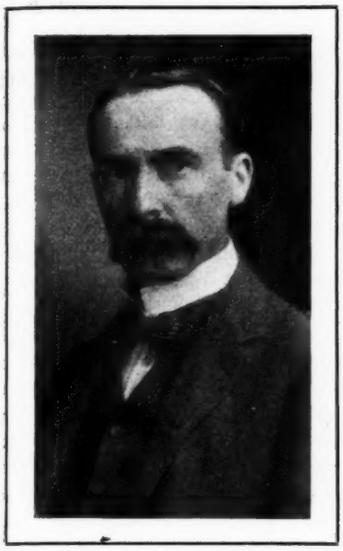
As indicating the relative situations of the two systems in the territory about Spokane, the following figures are given:

	Independent	Bell
Sandpoint	720	48
Spirit Lake	106	1
St. Maries	240	4
Coeur d'Alene	800	400
Ferrell	70	2
Harrison	100	60
Ione	96	0
Metaline Falls	90	0
Post Falls	106	1
Rathdrum	90	8

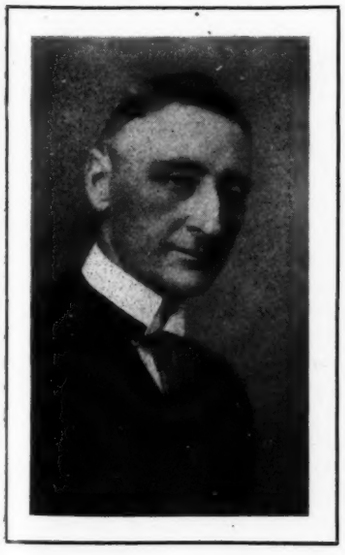
In the towns shown, therefore, the Independent system is operating over 2,400 telephones, as against the Bell's 524.

A Quartet of Men Prominent in the Telephone Field

WALTER C. POLK, general superintendent of the Kansas City Home Telephone Co., Kansas City, Mo., was born in New Vienna, Ohio, in 1869. He graduated from the Ohio State University with the degree of civil engineer. From 1895 to 1900 Mr. Polk was connected with the Central Union Telephone Co., as assistant superintendent of construction. During the next seven years he was associated, as chief engineer, with the Central Construction Co.—the E. L. Barber and James S. Brailey syndicate. This corporation built a number of important Independent telephone plants in various parts of the country, among them being Toledo, Louisville and Kansas City. From 1907 to 1910 Mr. Polk maintained offices at Toledo, doing special report and appraisal work. In the latter year he was appointed general superintendent of the Kansas City Home, his present position. Previous to entering the telephone field in 1895, he was engaged in railroad construction and maintenance of way, at Columbus, Ohio, being connected with the C. S. H. Railway and the Columbus and Sandusky Short Line Railway.



W. H. CAMAN, general manager of the New Home Telephone Co., Beatrice, Neb., was born in Elmwood, Ill., December 12, 1867. Early in life Mr. Caman made a reputation as a band conductor. He organized and led a number of bands, notable among which were one at Wellington, Kans., and one at Winfield, Kans. In 1901, he was one of the organizers of the Winfield Telephone Co., of which he became manager, superintendent and a director. He served in these joint capacities until 1906, when he associated himself with the New Home Telephone Co., of Beatrice, as general manager, with which concern he is still connected. He is a director in the New Home, and is president of the Home Independent Telephone Co., of Filley, Neb. Mr. Caman is also the proprietor of a haberdashery business in Beatrice. He was a member of the Kansas association when in that state and served on the executive board. In Nebraska he is associated with the state association and has served as a director. He is an Elk, a Scottish Rite Mason and a director of the Beatrice Commercial Club.



JAY GORDON MITCHELL, engineer for the North Electric Co., Cleveland, Ohio, dates his connection with the telephone business from June, 1893, when, upon graduation from high school, he went with the Cleveland Telephone Co., as troubleman. He continued with the Cleveland company at intervals in his attendance at Adelbert College, at Cleveland, until 1896, when he became assistant electrician for the Cleveland Machine Screw Co., being later chief electrician. In 1910 he was engineer in charge of power equipment for the Cleveland Telephone Co.; later he became general inspector, covering all maintenance, new construction and central office equipment, remaining until April, 1905, when he went with the North Electric Co. as electrical engineer. In September, 1909, he became assistant sales manager for the Dean Electric Co., Elyria, Ohio, and afterwards sales manager. In April, 1911, he returned to the North company as sales engineer. Mr. Mitchell is an associate member of the American Institute of Electrical Engineers and a member of the Cleveland Advertising Club. He was born in Cleveland, November 7, 1876.

C. I. STOCKING, general superintendent of the North East Kansas Telephone Co. and the Southeast Nebraska Telephone Co., with headquarters at Hiawatha, Kans., was born in St. Joseph, Mo., May 27, 1879. His education, begun in the public schools of Troy, Kans., was completed by a correspondence course and by over fifteen years of practical experience. Before entering the telephone business, Mr. Stocking was a telegraph operator for the Postal Telegraph-Cable Co. In 1898, he installed a telephone plant at Troy, Kans., which was the second Independent property in that part of the state. In 1899, he sold the Troy plant and entered the service of the Citizens Telephone Co., St. Joseph, Mo. In 1901 he resigned and went with the North East Kansas company as manager of its Doniphan county plants. In 1905 he was promoted to the general superintendency of the entire system. The Southeast Nebraska company secured his services as general superintendent in 1910. As engineer of both companies Mr. Stocking has practically rebuilt both systems

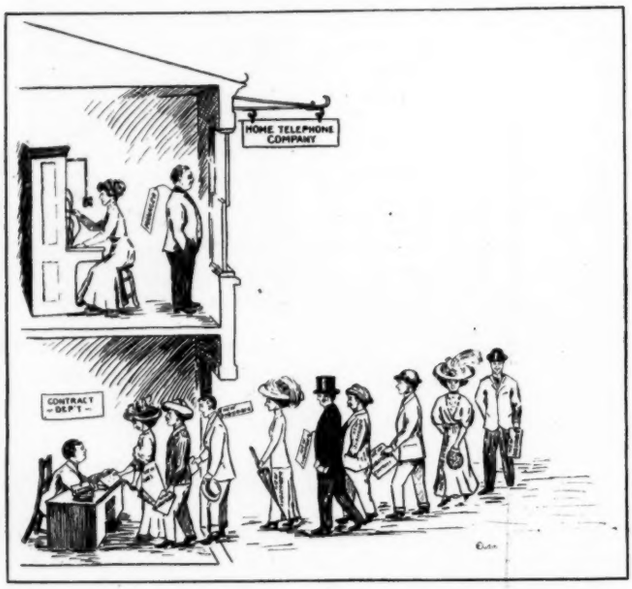
Practical Telephony for the Practical Exchange Manager

The Second Installment of a Series of Articles Relating to the Management and Operation of a Moderate Size Exchange—A Review of the General Situation—Discussion of Wants of the Public in Relation to Telephone Service

By H. R. Van Deventer

Before taking up the analysis of the wants of the public in a particular locality, a brief review of the general situation, or want for telephones as it now exists, is advisable.

Never before has the demand for service been so great, or the situation, as a whole, so favorable to the establishment of small and medium sized operating companies, especially in the rural districts of the South and West. The time is almost here when telephone service will be so good and so cheap that the average laborer cannot afford to be without it. This increased demand is gaining every day. Even now the practical farmer considers the telephone one of the essentials of his existence. The field, therefore, presents to men of energy and ambition opportunities which they can ill afford to neglect. The demand for service is great and can be met at a profit.



"Never Before Has the Demand for Service Been So Great."

Personally, I believe that the older companies, with all their aspirations toward "universal" service, can never take care of the development of this country properly; that is, they will never be able to push telephone service to the point of saturation as rapidly as the public demands it. I think the reason for their inability to do this is their size and massiveness and the unwieldly organization which they seem to possess. The starting of the smallest telephone company, to them, involves almost as much expense, in the initial steps, as does the organization of a large exchange.

There is the legal department, the right-of-way department, the traffic department, the construction department and several other departments to be consulted, plans to be made, "lay outs" to be considered, rates to be promulgated, etc. All of these departments are under the supervision of experts who get large salaries. There are an innumerable number of papers to be written, read, revised and consulted, before even the smallest exchange can start to earn money. The mass of detail which must be gone over, by a number of people, and the numerous officials who must be "consulted" before anything can be done, makes the local exchange proposition one that will not pay for them.

After the company begins its existence there is a world of auditing to be done, a settling of the accounts of one department with the other, and a vast mass of internal departmental affairs to be written about and talked over which makes the practical operation of the plant terribly expensive.

In the affairs of any large corporation, there comes a time when the "system" of routine management becomes a heavy tax upon the business. The writer knows of one organization where as simple a thing as a requisition for a pair of brushes for a dynamo, or the purchase of a barrel of dry cells, involves an expense of $1.56. In other words, it costs $1.56 for clerical work, bookkeeping, auditing, etc. This was so bad, that the process was simplified.

This is not a criticism of the management of such companies, but a comment on their condition. They realize the state of affairs and are trying to remedy them. But the small company always will have the advantage. It is like the light cavalry, mobile, active and in the best possible position to get quick results.

Then, again, there is another trouble that the larger companies usually experience. The men and particularly the officers managing their small exchanges do not belong to the town in which the exchange is located. These men are usually foreigners in one sense of the word, and being employes of a large corporation, are often looked upon with suspicion. None of this feeling exists in the case of home-owned, home-managed companies.

For these reasons it will be seen that conditions are favorable for the organization of local companies, and the development of local situations, and that the chances for success today are greater than ever before.

Another favorable condition is the liberal attitude of the older company towards the physical connection proposition. Their present attitude is partly one of enlightened policy and partly one that they have been forced into by circumstances.

It is now apparent to any one who looks into the situation that the various long distance companies do not seek to control local telephone properties, but would much rather leave them to be home-owned and controlled, with a traffic connection, or some sort of an agreement whereby the long distant companies secure the long distance business and the home company remains entirely free to handle its local and rural toll traffic as it may see fit.

Another phase of the situation which has redounded most favorably to the home-owned company is the matter of government, state and municipal rate regulation and the attitude of the public thereto. There is hardly a state in which this matter is not receiving daily attention. State commissions are now numerous and even the federal government is interested in the future of combinations, which if in any way oppressive, will be promptly regulated. From the way in which the tobacco and oil companies have prospered as a result of this legislation it is difficult to see

where it works a hardship, but it shows that the people are on their guard, and it makes those companies which are inclined to be unfair, more careful of the people's rights.

The telephone business in a certain way, especially as regards the long distance business, tends toward a universal standard of service and a standard of efficiency for the instruments, wires, switchboards and other appliances which are connected during a long distance conversation. In addition to this, uniform methods of accounting must be used, or endless confusion will result. None of these problems can be so well handled properly by a large number of companies operating independently of each other, so there is either an actual centralization of power, or some agreement on these points.

I may be accused of favoring the so-called "universal" service. I do not. I do, however, favor service and, from experience, think that the more universal it is up to a certain point, the more valuable it becomes to the public and the better it pays the company.

Kind of Long Distance Service People Desire.

It is well to point out, however, that in many cases there is no desire on the part of the local telephone subscribers for long distance service; but where such a desire is expressed it is foolish on the part of those contemplating the organization of a telephone company to ignore it, or to make half-way, indefinite promises, as to long distance connections in the future. If there is a definite demand for long distance service, arrangements should be made in the beginning to take care of this demand, otherwise trouble and dissatisfaction will surely result.

It is true that over 90 per cent. of a telephone company's business is local business, or business in the surrounding county or territory immediately adjacent the town or village in which the exchange is situated. But the remaining 10 per cent., or the long distance business, is often of vital importance to a number of the company's most important subscribers. Often these subscribers are among the most influencial business people of the community and, if their wants are not properly recognized and taken care of, they are disatisfied and soon spread their dissatisfaction to the others.

This condition of affairs was taken advantage of by the older companies in the early days, when competition was fierce. They would emphasize the fact that the home company could not give long distance service and, by getting two or three of the people in town, who had to have the long distance service, to agitate the proposition, the importance of it was so magnified that finally a majority of the people would consider it an absolute necessity. This would often drive the home company into an unsatisfactory and one-sided licensee arrangement.

There never was and never will be a condition existing where a local company must connect with a long distance company to secure good service. Good service originated with the home-owned and operated companies, and the finest service in the world has been developed by the Independents. The apparatus and methods in use in these exchanges represent the latest and best in the art and, in this respect, the home-owned companies are not only better off than the older companies, but have nothing to learn from them. In fact, the shoe is often on the other foot, as many of the older companies would find it much to their advantage, from a service standpoint, *if today they could buy their equipment in the open market.*

But, to get back to the analysis of the wants of the people. The average community today wants a combination service; they want good, cheap local service, with facilities for long distance connections when desired. They want rates based upon a 90 per cent. local business, and do not want to pay an exorbitant rate simply because the long distance service is available.

Under existing conditions this can be easily taken care of, whereas a few years ago it was well nigh impossible to give both good local and long distance service except at an exorbitant rate. Times have changed and now it is possible to give both classes of service at a rate which a few years ago would have been considered cheap even for a good local service.

In talking with the people, when the question of long distance service is brought up, it is well to gently inquire just how much of such service is necessary. The idea the average person has who wants long distance service, or rather the collective idea in many small communities, is well illustrated by the story of the Irishman who went into a restaurant for the first time in his life. He did not know just exactly what he wanted, so thought he would watch the other patrons. A stranger opposite him called the waiter and said: "Bring me a boot jack." Immediately the Irishman called out: "Waiter, bring me a boot jack" —and he was barefooted.

The people often want long distance service without knowing exactly what it is, but demand it because they have been told it is necessary for them. Often they think it is a peculiar kind of service. This is no doubt due to the fact that, in the early days of the telephone business, two distinct classes of companies and two distinct classes of instruments were recognized; one, the long distance company with its so-called long distance telephones, using patented transmitters and receivers which could be obtained only from one source; the other, the local or home-owned company using instruments adapted for short line work.

This condition existed for a number of years until the fundamental patents expired and a number of manufacturers went into the business of producing the so-called "long-distance" transmitters and receivers. The condition has long since passed away, but the idea of the difference between the long distance and local company still exists in a vague way in the minds of many people. So, when a new telephone proposition is discussed in a community, there are many who will ask you to give "long distance" service, not meaning service to distant towns and cities, but a high class, efficient service, with good telephone instruments. I have encountered this idea of the term "long distance" in many instances.

Local Conditions Affecting Telephone Service.

It may be said, however, that the day of the strictly local proposition is at an end. Practically every telephone company, no matter how small, must seek an outlet. In many cases it is sufficient that it connect with the nearest city or town, which almost invariably has a connection with some other company, and so on, until ultimately a section of several states is covered.

In the preliminary review, these points, which are among the most vital, must be found out, thoroughly discussed and analyzed, namely: What points do the people want to reach, what territory must the company cover, what connections can it advantageously make for an interchange of service, how much territory must it cover on a monthly rental basis and how much must be toll territory? Again I repeat, if a demand for long distance or toll service exists in a community, do not try to ignore it, but make rates to take care of it.

Some communities, by virtue of the industries which exist in them, and on account of the general character of their community business, are more self-contained, as it were, than others. I have in mind a small city having quite a number of various industries. This town is in-

dependent, in a way, of its neighboring communities, and the amount of long distance business done is the minimum. I know of another small town having only one manufacturing plant. Practically every one in this place, is with, or is interested in the manufacturing industries in two towns located, respectively, ten and eighteen miles away. In this instance, over 40 per cent. of the total amount of business handled is to these two towns. In addition this town, being midway between the two referred to, handles the through switching for these places and is the junction point of lines to two other small towns and the surrounding country.

This condition is, of course, abnormal, but in this particular instance a satisfactory long distance service was more necessarily desired than local service. The exchange which was primarily started here had this in view and was a success from the beginning. All distant towns are on a toll basis, a charge being made for every call. The strict-business rate, with 700 stations.

Another peculiar thing about this town is the abnormal number of pay stations in use. The company finds that it pays to establish these stations in considerable numbers. The reason this proposition has been a fine paying one, and has paid up to 20 per cent. for the last ten years, is on account of this careful study of every problem as it has arisen.

Another particularly favorable factor tending to make the establishment of new companies attractive at this time is the general awakening that is taking place throughout the United States, along the line of better facilities for communication. This has been caused in a great measure, by the rapid spread of education, due to the unexcelled educational facilities for which this country is noted. Now the telephone stands first as a medium of communication between people. It is immeasurably nearer to them than the telegraph, its nearest rival, which requires expert operators. The telephone is everybody's instrument, and far outranks all others.

Another factor is the development and perfection of apparatus, which is now so simple, durable and efficient that but little skill is necessary for its setting up and maintenance. This is what has made the farm telephone line a paying proposition to the telephone company instead of a source of worry and expense.

What Practical Telephony Includes.

We see, therefore, from a general review of the situation, that there is no time like the present for the establishment of lines and systems. At no time in the past have conditions been so favorable as now. The people want service, they are educated to demand it, and understand its proper use. The long distance companies are favorably inclined towards connection with the smaller or home-owned companies. Construction material does not cost any more than it ever did, while the general increase in population and the betterment in the condition of the masses of the people makes a greater demand than ever.

The farmer is no longer content to shut himself up and read the almanac during the long winter evenings. And his children, who have been away and seen the advantages possessed by others, are no longer willing to do without those advantages, particularly the telephone. It is needless to point out all the advantages of a telephone system in a rural community. These are so well known and so apparent that they call for no comment here.

The foregoing apparently does not relate much to "Practical Telephony." Unfortunately there are too many men who consider that "practical" telephony relates only to the stringing of wires, the connection of telephone instruments, and the operation of exchange equipment. As a matter of fact, practical telephony consists just as much of an intelligent interpretation of the telephonic wants of the people, and the intelligent meeting of those wants, as it does of the efficient operation of the physical means necessary to satisfy them. It is for this reason that I have given this brief preliminary review of several psychological facts which must be considered when organizing a company. The more closely these facts are studied, the quicker and greater will be the ultimate success of the project.

There are too many "practical" telephone men in the sense that they understand only their wires, their telephones and their switchboards, and who think that giving service consists in the operator answering the greatest number of calls per minute.

One of the most inefficient operators I have ever known was, at the same time, the fastest. Her manual dexterity was unexcelled, yet her reputation for "sassiness" and abuse was known to every P. B. X. operator throughout the city in which she worked. Never directly discourteous—that is, she kept within bearable limits—yet, in many little ways, she made more enemies for the telephone company than the other sixteen operators in that exchange put together.

The manager there was a "practical" telephone man, who never threw away a piece of telephone wire and never wasted a dry cell. It was his boast that, when he took a dry battery out of a telephone as useless, he would punch a hole in it and set it in a jar of salt water to use on the pole changers. He used to sit up nights watching those batteries so that they would not go bad on him and put the ringing out, and loss of sleep spoiled his temper.

He did his own instrument repairing. His exchange was well kept from a physical standpoint, yet there was not a man, woman, child or dog in the town who liked him, for the reason that he paid no attention whatever to the psychological side of the telephone business. He considered that his duties to the public were fulfilled when he gave them service and kept the physical end of his plant in working order, while this in reality is only a part of the problem.

(To be continued.)

Germans to Inspect American Systems.

A dispatch from Berlin, Germany, says that three engineering officials of the German post office department are about to sail for the United States in order to investigate American telephone systems. They will be gone five weeks, and will visit New York, Philadelphia, Boston, St. Louis, Chicago, Columbus and other cities.

The trip is undertaken with a view to introducing radical and much-needed reforms in the antiquated German telephone system. Telephones are cheap in Germany, but they have few other virtues. The average office and house telephone in the biggest cities costs $50 a year, and long-distance messages, regardless of mileage, cost twenty-five cents apiece between any two points for a three minute conversation.

In other respects the service is abominable. Telephoning after ten o'clock at night in cities costs five cents extra, and connections are possible only after a delay of three to five minutes, owing to the reduction of the daytime staff by about 75 per cent.

American telephones are regarded in Germany as the best in the world, and the hopes and prayers of business men and householders accompany the post office department's commissioners to America.

Use Concrete Telephone Poles in Illinois.

The Central Union Telephone Co. is installing concrete poles from La Salle, Ill., to the county line. They are replacing wooden poles which parallel the canal, and which have been adversely affected by the moisture.

Sparks from the Troubleman's Department

An Unappreciative Husband.

"What is the matter, dear?" said the Business Man to his wife upon returning home one day.

"Matter? I'm a rag."

"Pardon my candor, but you look it! What's happened? Here, sit down,—are you going to faint? I haven't seen you look so bad in I don't know when."

"No, I'm not going to faint. Don't be silly. It's all right. What's the news at the office?"

"You can't turn it off that way. You are always spruced up and fancy free when I get home, but to-day something must have gone wrong because you haven't even changed your——"

"Wait until after dinner, and I'll tell you about it. It's ready now. I'll dress later,—or go to bed."

"Go to bed? Isn't that the limit! I started to telephone you to meet me at the office and we'd go out to dinner first, but I remembered my togs, so thought we'd eat at home and go in together,—and here you say you are a rag and are going to bed. Forget all about Clara Marsh's reception to-night? Must be something wrong, as I said before."

"Oh, dear, it's all that old club. But come on in to dinner. It's waiting."

"Club? Your precious Amalgamated Society of——"

"Yes, that. You know, Will, that it's very expensive living these days. Yesterday I read a paper before the household economy and moral uplift section of our club, and as I didn't know what to talk about, I took up the matter of shopping that the papers say so many people say costs more if you do it by telephone than—what are you laughing at?"

"Nothing. Go on. Gee! Did you buy this,—Lor—make—thankful—'bout—receive—'men,—for mutton or lamb?"

"Lamb, of course. I selected it, saw it cut, weighed and wrapped up. And I saved a cent a pound on it, too,—that makes seven cents."

"Are you sure you got the piece you selected? Better stick to the telephone and leave it to the butcher, if you did. But how about going in to Clara's reception?"

"I just can't do it. Go over to the telephone and telephone our regrets. Say I have an awful headache or anything—I just can't do it. I am sorry, too, because Clara was my bridesmaid—didn't she look sweet?—and this is—"

"Brace up, old girl, and come along. Tom's a good fellow, too, and we mustn't disappoint them. Can't do it? Got to get up early to-morrow so all the best things won't be picked over first? You never did that before. Oh, I see,—I'll call 'em up when we're through. So that's the racket—want to get there before the telephone orders are in! Thought you said these were new potatoes? They're in the markets now."

"They don't look like new potatoes now they're cooked, do they? Isn't that funny? They were three cents a peck cheaper, and that made just ten cents I saved. I asked the grocer if he didn't think new potatoes high and he showed me others, but didn't say they weren't new. I wanted to get some asparagus, too, but it was all gone and it was getting so late and I was so tired I haven't got over it yet and when I got to another grocer's he said all his best bunches were being sent out on telephone orders and he knew how particular we are and I wouldn't like the ones he had left, so I came home because I knew you wouldn't mind a simple dinner to-night, under the circumstances. I usually call up two or three grocers and find out what they have and compare their prices, which of course also saves a lot of time, but I found it a different proposition when I tried to see everything to-day."

"For goodness sake, was this coffee left over from yesterday?"

"No, that's freshly made coffee. We were all out and it cost only twenty-three cents a pound; that's what you can do when you shop in person.—Oh, well, if that is the way you feel! I do my best to economize and wear myself out to a frazzle and this is the thanks I get."—Telephone Review.

Going Up in Detroit.

At least one young woman employed in a down-town skyscraper enjoyed a refreshing diversion from her daily routine the other afternoon, says the Detroit News.

Telephone operators have been very busy during the festival period, and yesterday afternoon was no exception, so the young woman scarcely noticed the seedy-looking individual who strolled in from Woodward avenue and entered one of the telephone booths at her side.

Telephone bells jingled, and the switchboard clicked. Fifteen minutes flew by, which seemed hours to one or two men who were waiting to use the booth.

"There's some one in there," said the operator.

"I know it, and he's been in there for nearly half an hour," said one of the restless men.

Just then the door of the booth opened six inches and a rustic head filled the aperture.

"Say, when is this dern thing goin' up?" said a bucolic voice through a set of chin whiskers.

The lank individual, wondering what the merriment was about, and what ailed the elevator, ambled out.

The Operator.

I'm only one cog in the big machine,
But maybe you will agree
There'd be many a kink or a slipping stroke
From the big fly wheels—and that's no joke—
Were it not for the hidden likes of me.

I deal in the gamut of human woes;
I shuttle the joys of those care free.
I'm waiting to serve you day and night;
I'm as used to the bleak as the great high light—
I, and the hidden likes of me.

And when you've all written and talked about
The things we do, may you see
That in spite of the fact we are not in view
We are nothing but human beings, too,
I, and the hidden likes of me.

—Telephone Bulletin.

Next to getting married, says a Chicago paragrapher, there is nothing so solemn and so charged with responsibility as filling out a petition to have a telephone installed or to have the service transferred from one house to another. And then one has to wait an age.

[Editor's Note: But the Independent company in Chicago has not yet tapped the residence sections of the city. Have patience.]

He (continuing his remarks over the telephone)—"Will you marry me, my dearest?"

She—"Am I the only one who can make you happy?"

He—"You are the only one who can make me miserable by refusing to marry me!"

In the Rural Line Districts

The telephone line was in bad order a short time last week, but was soon put to a mend. It is suspected that an aeroplane came a little near the ground, and caught the wires with a wing.—St. Leo Item in Canby (Minn.) News.

Mrs. Sadie Brand resigned her position as operator at the Independent Telephone office and left Monday to accompany her mother, Mrs. LeGrand, and sister, Estella, on their trip through the western states, after stopping three days at their home in Corning. It is with regret that the patrons of the Independent Telephone Co. see Mrs. Brand leave, as she was one of the most efficient operators that has ever been in the telephone service, although they wish her a pleasant trip, as she is deserving of the much needed rest. Miss Florence Hunter is the new operator at the office.—Massena (Iowa) Echo.

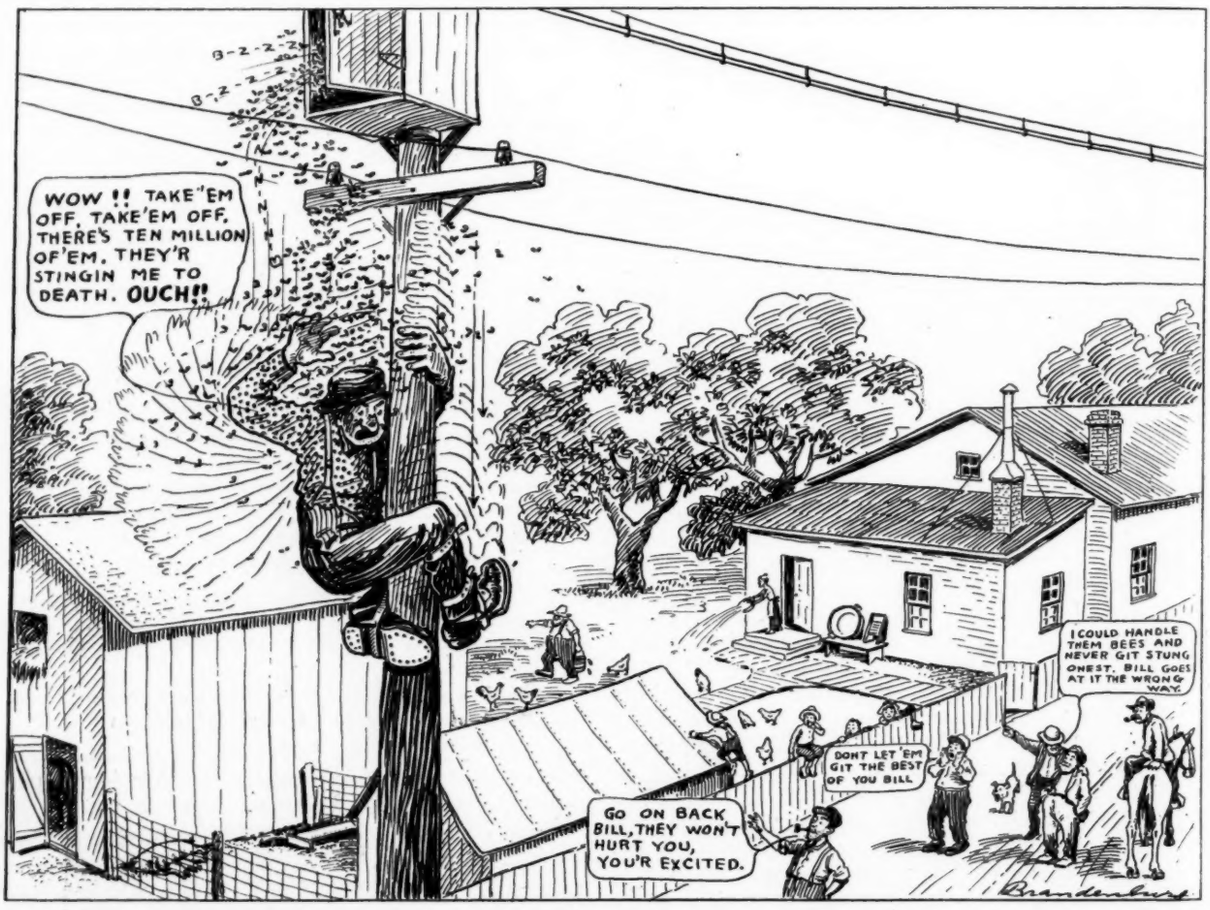
The local management of the Wisconsin Telephone Co. should stop the practice of some addle-pated youths who tie up the telephone lines for an hour with an inspired love twaddle. Get busy!—Chippewa Falls (Wis.) Herald.

W. M. Cates is having a telephone line built out to his Fox Pond still, 3½ miles west of Tallahassee, which puts him in touch with the good people of the community at large.—Fox Pond Item in Tallahassee (Fla.) Democrat.

Doc Phillips, the genial collector of the Hillsboro Telephone Co., with his family, returned on Monday from a visit to Ft. Smith and Van Buren, Ark.—Hillsboro (Tex.) Mirror.

The Chronicle this week finished the printing of the new Mutual directory, and if we do pat ourselves on the back, it's a nifty job. So is every job we turn out, for that matter. Sec. Patrick now has them.—Emerson (Iowa) Chronicle.

Miss Lucy Stump has resigned her position at the telephone central office, to take effect August 15. For the past fourteen months she has given efficient service and it is with regret that the patrons learned that she has resigned. She has given good satisfaction and the management will find it a difficult matter to get another with Miss Stump's experience. Miss Stump has secured a position with the Globe Mfg. Co., in Abingdon.—St. Augustine (Ill.) Eagle.


WOW !! TAKE 'EM OFF, TAKE 'EM OFF, THERE'S TEN MILLION OF 'EM. THEY'R STINGIN ME TO DEATH. OUCH!!
I COULD HANDLE THEM BEES AND NEVER GIT STUNG ONEST. BILL GOES AT IT THE WRONG WAY.
DONT LET 'EM GIT THE BEST OF YOU BILL
GO ON BACK BILL, THEY WON'T HURT YOU, YOU'R EXCITED.
Brandenburg

Linemen for the Corn Belt Telephone Co. met with a warm reception when they inadvertently came upon a big swarm of bees in the cable box at the corner of Walnut and Maple streets. Trouble with the wires had been experienced and the employes planned to investigate the box. Will Sentman, who climbed to the supposed seat of trouble, was put to rout when he opened the door. A large number of angry bees poured out, drove him to the ground and away from the scene. The matter was reported to L. L. Lininger, who arrayed himself in mosquito netting. Thus protected, he climbed the pole and made observations. He wore gloves, but in scooping the bees from their unusual home he received four stings on the end of one finger. The wounds left no ill effects.

Mr. Lininger, wishing to avoid annihilating the busy workers, endeavored to expel them from the box by smoking them out. This plan was ineffectual, because the bees would move from place to place about the box, but would not desert their new found home. It then became necessary to use sulphur.—Waterloo Item in Marshalltown (Iowa) Times Record.

"It's never too late to mend" is an expression as old as the hills and very true.

"A stitch in time" is better tho' and saves lots of trouble.

If you're equipped with Copper Clad you have no mending to do.

If not, "mend your ways" and "take a stitch in time."

Copper Clad is the wire you'll eventually use, for telephone men take to it like young ducks go to water.

NATURAL LIKE!
Our new catalog is worth having.

Manufactured exclusively by

Trade Mark
"Weld Clad"

DUPLEX METALS COMPANY

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NEW YORK OFFICE
30 Church Street

INTERESTING NOTES ON CONDENSERS

In the early days of telephony, Condensers were invariably built up from solid tin foil and waxed paper. Such Condensers are, however, apt to break down and become crossed or short-circuited, especially under modern conditions.

A grit in the foil or a pin-hole in the paper is sufficient to cause a breakdown, and the defect can seldom be made good because the two foils become welded together by the current passing through the fault. Occasionally the weld can be burnt out by a strong current, but this generally damages the Condenser seriously, because the solid foil is of appreciable thickness and requires a heavy current to fuse it.

The minimum thickness of foil commercially usable is determined partly by the high cost of rolling the metal, and partly by the difficulty of handling extremely thin foil. Consequently, the foil commercially used is much thicker than is called for by the electrical conditions.

The ideal conditions of an extremely light and thin film of metal, combined with considerable mechanical strength, seem therefore to be impossible of attainment; but, nevertheless, the apparently impossible actually has been attained, and as the result, the manufacture of Condensers is being revolutionized.

The solution of the problem was found by the English telephone engineer, G. F. Mansbridge, who conceived the idea of employing for Condenser work a specially prepared metallized paper, i. e., a paper upon which is deposited an extremely thin film of pure tin, forming an even and continuous conducting layer in absolute contact with, and inseparable from, the paper.

In this combination, the paper provides the necessary mechanical strength, and the thin film of tin the conducting electrode. The thickness of this film is such that, whereas there is ample conductivity for all telephonic currents, there is so little mechanical strength **in the film alone** that it instantaneously shrivels up if subjected to currents greatly in excess of its normal carrying capacity.

This property of shriveling up under excessive current is of great value, since a Condenser made from such material (known generally as a **MANSBRIDGE CONDENSER**) is rendered absolutely proof against breakdown from internal crossing or short-circuiting. If an internal short-circuit be accidentally or purposely produced, the Condenser at once begins to discharge itself across the point of short-circuit and the momentary current concentrated at this point is strong enough to shrivel up the conducting film **immediately surrounding** the point.

By this **localized** shriveling up, the film isolates itself from the point of breakdown, and the insulation of the Condenser is preserved, since the heat developed by the transient current is insufficient to scorch the paper.

This automatic sealing of the breakdown point may be repeated thousands of times, and still the Condenser will retain its capacity and its insulation.

So instantaneous is the sealing that, if a pin be driven into an insulated charged **MANSBRIDGE CONDENSER** so as to cause a short-circuit between the electrodes, the rush of current to the puncture will seal up the defect before the Condenser has had time to do more than partly discharge itself. A dozen or more such punctures may be made before the Condenser becomes discharged.

Just as a **MANSBRIDGE CONDENSER** seals up when punctured by a pin, so does it seal up, automatically and instantaneously, when the puncture is due to a lightning discharge or other high tension current; and it is because of this remarkable and permanent immunity from breakdown that the Condenser was named **by its users** the **MANSBRIDGE DREADNOUGHT CONDENSER.**

Besides possessing this valuable and unique property of automatic sealing, **MANSBRIDGE CONDENSERS** are cheaper, smaller and lighter than those made from solid foil; and they consequently are forcing their way to the front and becoming **the accepted standard everywhere.**

They have been adopted exclusively by the English government Telegraph and Telephone Administrations; and they are made under license by Western Electric Company, L. M. Ericsson Co., Electric Specialty Co., Stromberg-Carlson Co., American Electric Telephone Co., and by numerous other licensees all over the world.

Insist upon having MANSBRIDGE CONDENSERS and save money in first cost, and also in maintenance.

For further particulars and for terms of manufacturing license in U. S. A. and Canada apply:

G. F. MANSBRIDGE, Mount House, New Barnet, England

RATE DISCRIMINATION IN NEW JERSEY.

(*Continued from page 470.*)

number of other companies having reciprocal relations; and a number of Independent companies having no connection with either the Bell or the Keystone companies."

Following this was a list of companies connected with the Bell and the Keystone systems, as well as those connecting with neither. The list gave the gross receipts in 1910 as an index of the magnitude of the operations carried on by the companies. The report then continued:

"A number of the companies serving rural districts were originally organized as mutual companies and provided service to stockholders only. As time has gone on, customers have been added who are paying rates on a basis different from that charged to the stockholders, thus bringing about an apparent discrimination which will be referred to later.

A study of the statements filed by the companies shows that most of the companies furnish more or less service at rates other than those that are now standard. Lists have been obtained from each company showing the telephone service furnished free to the municipalities or officials representing them. In this report, no further reference will be made to this class of free or reduced rate service, as such service is, in almost all cases, furnished in accordance with terms of franchise under which the companies are operating, and for the purposes of this inquiry are not at this time to be considered as unduly discriminatory.

A study of the situation generally shows that the variation in rates charged has been brought about partly through the inauguration of new rate schedules while old customers continued to receive service at the old rates, and partly through the efforts of competing companies to obtain all the customers possible.

In my opinion, all telephone subscribers could be classified under the following headings:

First: Rates now standard.
Second: Rates which have been standard, but which have been superseded by new rates, old contract rates still being charged. Service same as under the old rates.
Third: Rates which have been standard, but which have been superseded by new rates for a different class of service, the old class of service not being now available for new customers. This refers particularly to changes in area and changes from flat rate schedules to message rate schedules.
Fourth: Special rates to hospitals, homes, etc.
Fifth: Special rates to ministers.
Sixth: Special reduced rates in payment for right of way privileges.
Seventh: Free telephones in freight offices and depots for the benefit of regular subscribers in calling up said depots.
Eighth: Free or reduced rates to municipalities for telephones in public offices, fire and police stations, school houses, etc.
Ninth: Special rates for telephones in homes of municipal officials.
Tenth: Special rates for telephones in the homes of general officers of the company.
Eleventh: Special rates for telephones in the homes of operating employes of the company.
Twelfth: Special rate service in exchange for attendance at small town switchboard located in stores, etc.
Thirteenth: Subscribers having no claim for special consideration who are receiving service at other than the standard rates.

(1) The first class requires no comments.

(2 and 3) In the Delaware & Atlantic territory, at least 25 per cent. of the subscribers are receiving service at non-standard rates. These subscribers almost wholly are classified in the second and third classes, No. 2 being the class where the rate has been changed without any change in the character of the service rendered; No. 3 being the class where the rate has been changed but where the new rate applies to a different character of service from that furnished before the change. All subscribers in classes 2 and 3 should be placed upon standard rates as soon as practicable. The only question which arises in connection with this is as to whether any of the old customers have been allowed to retain their old rates longer than good business policy or a strict interpretation of the prohibition against discrimination would permit.

(4) In the southern part of the state, the practice appears to have been quite general to furnish hospitals and similar institutions with telephone service at special reduced rates.

(5) A similar practice is in vogue with reference to ministers of the gospel regularly ordained.

(6) A great many telephones are in use by subscribers who receive same in exchange for right of way privileges. Among these are individuals, various railroads, various electric light companies, etc. In connection with such telephones, it would be best if all subscribers were carried on the books at regular rates applicable to the class of subscriber, and the subscriber could then be given credit for the amount which the right of way privilege is estimated to be worth. Both the income account and the expense account would then show the true condition of affairs.

(7) For the benefit of subscribers generally, a number of telephones have been installed in depots, freight offices, municipal buildings, etc. The parties where the telephones are located having refused to subscribe for the same, the telephone companies have felt justified in installing these telephones for the benefit of their subscribers generally. If such telephones are not used for the origin of calls, no great objection could be raised to their installation. If any one in the stations referred to desires to use the telephone, this right is accomplished by installing a slot machine and payment made whenever any one is called from said telephone.

(8 and 9) A great many telephones are furnished free or at reduced rates to municipal buildings and to municipal officials in their homes. Most of these are furnished, as stated, in accordance with the terms of ordinances granting the original franchise. In a number of cases they are furnished in accordance with supplemental agreements made at some time subsequent to the granting of the franchise. In my opinion all such service is in the nature of additional franchise tax. As the companies already pay real estate and personal tax and the state franchise tax, a grave question arises as to the right of a municipality to exact additional franchise taxes. This, however, is a matter for the future consideration of the board.

(10) There are a few telephones in use in the homes of officials and attorneys of the companies, but the number is very limited. They, however, might be considered as part payment for services rendered.

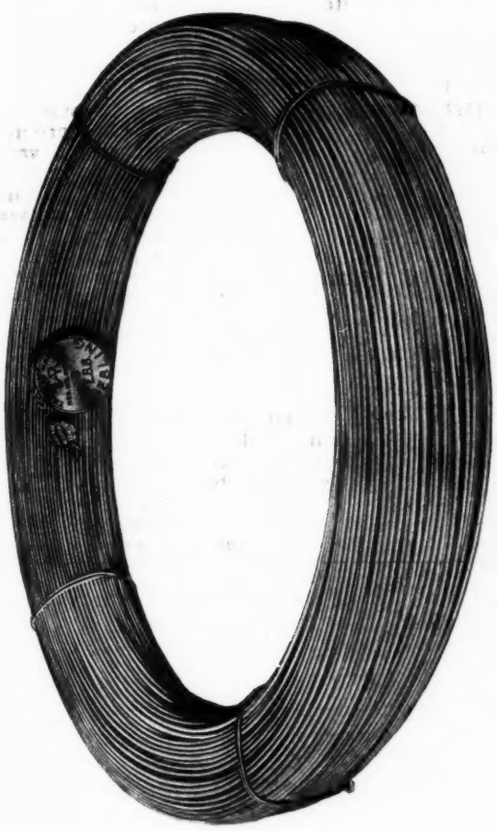
(11) It is customary to furnish telephones in the homes of certain operating officials in order that they may be within call. These could not be considered as a part payment, nor as a free service, but part of the regular operation of the telephone system.

(12) In a number of the smaller towns switchboards have been installed in stores whence radiate a half dozen or more lines to the surrounding country. The service at these switchboards is too limited in amount to warrant the regular employment of an operator, and in a number of cases the store-keeper attends to the switchboard whenever there is need for it, and receives in exchange a certain amount of free service over the lines of the telephone company. Such an arrangement is of course justifiable, but it perhaps would be better if the books of the company would show that the ordinary charge is made against the subscriber and that he would then be credited with an amount in payment for his services. The books would then show the exact conditions with regard to such subscribers. The charge for the maintenance of such telephones would come under operating expenses.

(13) It is impossible at this time to make any definite statements with regard to the furnishing of service at special rates to subscribers who have no claim for special consideration."

Following, the report gave a list of the companies and the various classes of discrimination practiced by each and added:

"In addition to the statements regarding discrimination by various companies, it should be understood that these statements are based on the information now available, and a careful detailed study of the subscribers' ledger of each company might develop that there were subscribers to various companies falling under class 13, that is, subscribers receiving service at special rates who are not entitled to special consideration. No recommendation is made at this time with reference to such subscribers, but a general recommendation is made that a copy of this memorandum be sent to each company, calling attention



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of the manufacture of **Roebling Double Galvanized Telephone Wire** is conducted with one end in view —to produce durable, uniform wire of high conductivity.

The metals used are carefully selected, subjected to exacting tests to prove their quality, and **protected** against rust by real galvanizing.

John A. Roebling's Sons Co.

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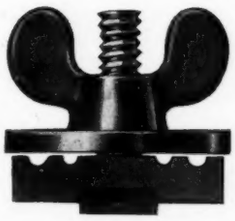
We make also Hard Drawn Copper and Copper Clad Steel Wire, Wire Strand and Telephone Cables.

Type R Pencil Fuse

No. O



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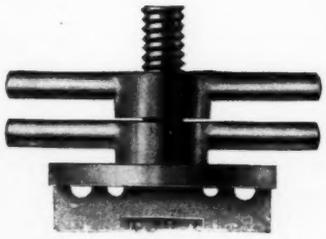

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Write for Samples. **Catalog Sent on Request.**

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Chicago, Ill.

to a provision of the public utility act of 1911 which forbids undue and unreasonable discrimination.

With reference to the recommendation made above in connection with the installation of coin boxes at railroad stations where telephones at such locations fall within class 7, it will not be considered improper for a company to adopt a general rule that its own subscribers may use such telephones in calling their own places of business without making payment therefor. The intent of the recommendation with regard to the installation of coin boxes being to prevent the free use of such telephones by persons who contribute nothing toward the maintenance and operation of the telephone system, thereby placing on regular subscribers an unnecessary burden."

Summing up the recommendations to each company, the report concluded, as follows:

"1.—Recommendations are made to various companies to proceed forthwith to eliminate all discriminatory contracts falling under classes 2 and 3 described above, by superseding these contracts with contracts at regular schedule rates.

That on December 1, 1912, each company to whom this recommendation is directed shall make to the board a report showing in detail to what extent the old contracts have been superseded, and that if all obsolete contracts falling under classes 2 and 3 have not been superseded by December 1, 1912, that notice shall be given that on January 1, 1913, no further service can be furnished except in accordance with regular scheduled rates.

2.—That a recommendation be made to all companies having or who may have subscribers falling under class 6, that is, subscribers receiving special rates as a consideration for right of way privileges, that no new contracts be taken which would fall under class 6, and that as opportunity offers, all contracts now in force for special rates given because of right of way privileges be superseded by contracts at standard rates, special consideration being given in some other form for right of way privileges.

3.—That a recommendation be made to all companies who have or who might have telephones falling under class 7, to equip such telephones with coin boxes, in order tnat persons calling from such telephones shall pay the usual rates charged in the territory where said telephones are located. It will not be considered improper for a company to adopt a general rule that its own subscribers may use such telephones in calling their own places of business without making payment therefor."

As to Joint Use of Telephones.

The St. Paul, Minn., aldermen propose to try to cut down the revenue which the Northwestern Telephone Exchange Co. receives from telephones used by several occupants of the same office. They have asked the corporation attorney whether an ordinance will be valid prescribing that when the telephone company charges a subscriber $1 a month for an extension connecting him with a telephone in the same office, it be required to place the subscriber's name in the directory without additional charge.

A case in point has been found in the office of a prominent physician. This physician pays $4 a month for a Northwestern telephone. Three other men, who occupy the same suite of offices, pay $1 a month each for an extension and $1 a month each for having their names placed in the directory.

To Resist High Rates After Merger.

Following the announcement by the Central Union Telephone Co. that a general raise in rates would go into effect October 1, the Anderson, Ind., city council will probably instruct the city attorney to draft an ordinance making it impossible for the company to raise its rates as contemplated.

Albany Hearing Postponed.

The hearing upon the Albany telephone rate complaint before the New York Public Service Commission, which was set for Thursday, October 1, has been adjourned to Wednesday, October 9. The adjournment was taken because Frank N. Bethel, vice-president of the New York company, will not return to New York from a trip abroad until October 1, and he desired a few days for preparation for the hearing before the commission. Arthur L. Andrews, who appears for complainants, the Chamber of Commerce, agreed that the request for an adjournment was reasonable.

Rate Question Up in New Jersey.

The New Jersey Public Utilities Commission will be asked to pass on the question of rates charged in Plainfield for telephone service, gas, electric light and water. The New York Telephone Co. controls the telephone system there.

Ask Lump Sum for Twenty Year Grant.

The Decatur, Ill., city council has decided to ask the Central Union Telephone Co. for $12,500 cash, for a twenty year franchise, instead of $1,200 annually for twelve years.

Western Pennsylvania Association to Meet.

The Western Pennsylvania Independent Telephone Association will hold its sixteenth quarterly meeting at the Hotel Bartlett, Cambridge Springs, Pa., on October 10 and 11, next. Representatives of the following associations in adjoining fields have promised to attend: New York Independent Telephone Assn., Indiana Independent Telephone Assn., West Virginia Independent Telephone Assn., Chautauqua, Erie, Crawford Independent Telephone Assn., and Mid State Telephone Assn., of New York.

Playing the Telephone Game.

The American states have long since experienced with the telephones what London now seems to be considering, says the Indianapolis News. An official rubric just issued by the postmaster-general in charge of the London telephone service, comes to local notice through the London telephone press. For the telephone game is one of the most subtle and hardly played of all our national pastimes.

The London officials advise wire patrons that "telephonic transmission blurs the distinctive sounds of consonants and tends to make words containing the same vowels sound alike. In passing numbers, therefore, it is necessary to speak more distinctly than in ordinary conversation. There is great risk of confusion between five and nine, and much difficulty in distinguishing between two and three. In London each figure is pronounced separately, wth the exception of doubles, which are so given.

One provision in the British telephone service will appeal especially to those of us who quarrel spasmodically with the operator.

"It is the duty of the operator to repeat every number passed by the subscriber in order to give the subscriber an opportunity of correcting any misapprehension. If in any case the repetition is not clear, the operator's attention should be called to the fact. If the repetition is incorrect the right number should be repeated very distinctly, with emphasis on the figures misunderstood. If the operator is not sure she has taken a number correctly it is her duty to ask the subscriber to repeat the particulars. Prompt compliance with the request, is of great assistance to the service."

Telephoning through some exchanges is a sort of neurasthenic novelty, continues the News. It gives revelation to more varieties of temperaments than can be found in the divorce records of a hundred courts. The psychology of telephone manners has been the subject of much speculation and flippancy.

We can appreciate the repetition order in the London rules book, having still freshly in thought the memory of that time when the stating of a double number, as, for instance, three, four, double five was acceptable. Who can not recall the frosty correction from central of three, four, five, five? Many of our telephone worries would be dissipated were attention given to the clause just quoted.

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Of Dry Cells
Are Handled In This Territory

FRENCH Telephone Cells

Are Manufactured and Shipped
Direct from Madison, Wis.

There is no reason why the dry cells *you* use should get old in transportation and stock rooms before you install them.

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FRENCH BATTERY & CARBON CO.
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We Guarantee
Greatest Efficiency
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Write for FREE SAMPLE
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Approved by Leading Institutions of Technology and Telephonic Science. Handled by most representative Jobbers and Supply Houses.

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W&M TELEPHONE WIRE

OUR W. & M. Telephone Wire is drawn from metal made especially for the purpose and rigidly inspected. The spelter is carefully laid on with uniform thickness, ensuring ample protection for the wire under extreme weather conditions.

In point of conductivity this good wire has attained the highest possibilities and we submit our three brands—"E. B. B." "B. B." and "Steel"—as the best that can be produced.

"W. & M. Telephone Wire News," a publication describing telephone wire in practical use, furnished free upon application.

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American Wire Rope	Barbed Wire
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Electrical Wires and Cables	Shafting Cold Drawn Steel
Rail Bonds	Wire of Every Description
Bale Ties, Tacks, Nails, Staples, Spikes	

We issue separate catalog for each of these. Gladly furnished upon application.

American Steel & Wire Co.'s Sales Offices

CHICAGO	72 West Adams Street	DENVER	First Nat'l Bank Bldg.
NEW YORK	30 Church Street	SALT LAKE CITY	720 South 3rd West Street
WORCESTER	94 Grove Street	SAN FRANCISCO	16th & Folsom Sts.
BOSTON	120 Franklin Street	PORTLAND	Ninth & Irving Sts.
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Department of Railway Telephony

The Fourth of a Series of Articles on Telephone Train Dispatching Takes Up the Question of Installation of Equipment—Distribution of Material Along the Line—The Installing Crew and Methods of Handling It—Use of Telegraphones by Chicago Great Western

Distribution of Material and Equipment.

By John A. Kick.

The first consideration in the installation of dispatching apparatus is: What equipment will be used as a standard at each station and what will be the method of distribution?

Assuming that all the equipment and material has arrived at some convenient distributing point, the next consideration would be the proper methods of effective distribution. Various methods have been used and nearly all have their points of favor. I believe the most unsatisfactory and at the same time most expensive, is the special train method, by which the material is all loaded into a car which is rushed over the division. At each station, a lot of equipment and material which in the rush is usually incomplete in some part is set out unprotected. To be told that you have to hurry or be delayed for some train at the next station, means delays later, by having a hurried assembly of the parts to be set off. Then, too, the equipment is set off to be left unprotected in some baggage or freight room.

The car is hurried through to the distant terminal, placing the surplus or forgotten pieces in a distant yard or storeroom, and in general causing inconvenience and expense. The same general effect is secured by placing the car in some way freight train with one or two attendants, although this plan is considerably less expensive than by the special train method.

The best results I have secured, were obtained from a method of distribution not generally used. The complete equipment for each of the first eight or ten stations out were carefully and securely packed in shipping cases, plainly tagged for the superintendent of telegraph. They were sent by baggage, one man accompanying to assist the baggage master in handling and to insure none being carried by its destination. When the first consignment has been delivered, a car carrying supplies moved to the next station beyond the last one covered by the initial distribution. It is generally aimed to make the first shipment cover enough installation work to allow ample time for movement of the car and it is carefully planned to have the car go to a station where it can be placed easy of access and from where the next baggage shipment can be easily made.

By this method, the car with the surplus material is at no time beyond reach for equipment and material made necessary by an unexpected condition and the shipping cases can be used several times by tagging the empties and shipping them ahead to the car.

Personnel of the Installing Gang.

Installing gangs are frequently too small to secure the best results. This is frequently due to ideas of economy which could be proven erroneous. In installing 28 way stations for two circuits including five test stations, we made what we believed to be an excellent record, considering the fact that the work was all up to the highest standard, i. e., the equipment perfectly aligned and adjusted; wiring formed, strapped and shellaced; the units uniformly placed; every part inspected and tested; drops run from the poles; eight pole boxes placed complete; and the circuit ready for service in seven days. The entire force consisted of a supervisor, three inside wiremen and one helper, two climbers and one ground man, and a motor car engineer, who also acted as pilot.

It was only by good team work that we were able to make such progress, as every minute of time was used to the best advantage. Each man was assigned to the work he could best do and was given assistance when required. The soldering irons and material, handled by the helpers, were always ready at the moment. A friendly feeling of rivalry between the inside and outside workers was not discouraged as it proved to some advantage in getting the work done in quick time.

Every piece of work was carefully inspected as it progressed, and the high standard was maintained, although the gangs were racing and might be expected to slight anything that might get by unnoticed. An unsoldered or untaped joint brought warning of dismissal on second offense. There proved to be no occasion to even reprimand anyone, after it became known that only first class work would be acceptable. A carefully compiled and itemized cost of the installation work on these two circuits resulted in the following charges per station:

Double installation	$6.50
Single installation	4.40
Pole box (including mounting of box)	3.00

The cost per installation for pole boxes is usually higher than the figures above, except in such cases where the boxes are on the outside of stations which are day stations only, and both installations are made at the same time, as was the case on this work.

Too many are of the opinion that unskilled labor can handle such work and fair results may be obtained if the supervision is of high class. But it is more expensive than to handle it with high class workman, even including helpers who can be of more help if their practised eye can take in the situation and allow them to anticipate the needs of the other man.

The man who drills a hole through a walnut table or desk and then looks to see if it is in the right place, or who drills through a condenser strapped against the bottom of the table and then looks to see where the tin foil is coming from, is not a howling success in this work. Again the man who can never remember whether the wire with the tracer or the plain braid goes to the left, or whether the red and yellow, or either, is the receiver circuit in the cord and who invariably mounts a switch upside down, is "ballast only." In fact he is even worse, as he does so much that must be done over that he is a great detriment.

In addition to the crew of first class workmen the supervisor or foreman should be given an opportunity to educate the maintenance man in the proper working and maintenance of equipment. The maintainer starts from a much better point if he is included in the installing work. He not only learns all the circuit details from experience in installing, but he gets a more familiar working idea and a mental picture of the location of all of the equipment and is better able to trace troubles.

Transportation of Installing Gangs.

Motor cars of the section gang type, and without cover, seem to be the very best means for transferring the men from station to station, as well as providing capacity for carrying duplicate parts of the equipment to be used wherever imperfect or broken parts are found. Movement of

Underground

CONDUIT SYSTEMS

our specialty

Work started at any point within 48 hours

Write us for estimate

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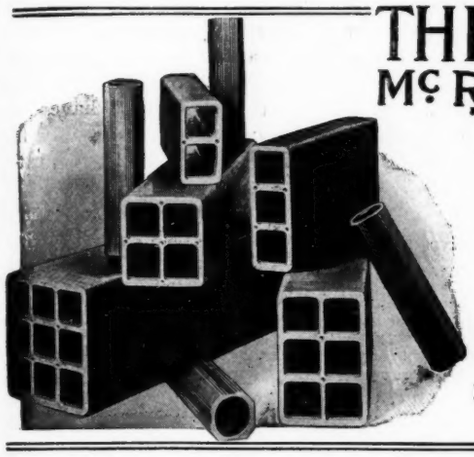

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Large stocks of both single and multiple duct constantly carried, thus insuring an early delivery.

Our conduits have been used for twenty-three years. Inquire about us in any city where conduits have been installed.

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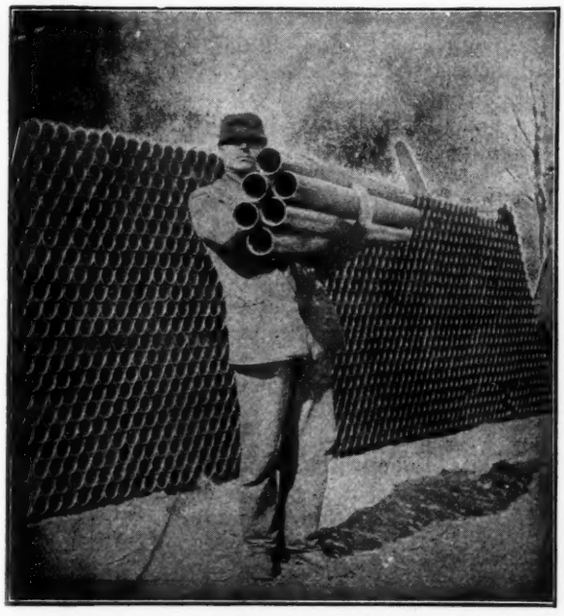

Carrying 30 feet 3-inch socket joint conduit.

Orangeburg Fibre Conduit

("Admitted to be the best Fibre Conduit")

Made in FOUR STYLES OF JOINTS

Socket, Sleeve, Screw and Harrington

WITH BENDS AND FITTINGS FOR SAME

Is the lightest conduit made

and means low freight and cartage costs

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MAIN OFFICE AND FACTORY
Orangeburg, New York
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Pierson, Roeding & Co.,
San Francisco, Cal.
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Please tell the Advertiser you saw his Announcement in TELEPHONY.

installers by regular train is unsatisfactory, as too much time is lost in waiting, and although it is often possible to double back and save some time, yet this is irregular and unsatisfactory.

The special train method of installation is expensive and generally unsatisfactory, as the work is too hurried to be first class. No gang can do well when continually hurried to help the train crew in making close meeting points. In other words, work of this kind handled by special train, resolves itself into too much importance of the train movements, advantageous lay-up points, fuel, water and, last but not least, the regulations of hours of service of the crew. Every one of these detracts attention from the main work at hand.

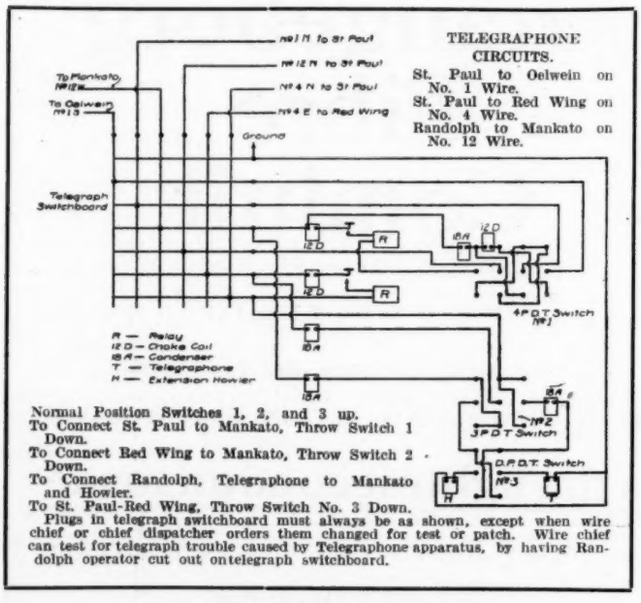
A motor car requires gasoline, which can be secured at almost every station, and requires only to be set off to one side and covered up when the day's work is done.

Telegraphones on the Chicago Great Western Railroad.

By G. O. Perkins.

[In the last issue of The Maize, the quarterly magazine of the employes of the Chicago Great Western Railroad, an article was published describing the use of the telegraphone by the Chicago Great Western. Owing to the extent to which the Great Western has used this apparatus, the article is of considerable interest to railroad men and is reproduced in full.—The Editor.]

Since the advent of telephone train dispatching, we see little in print about the telegraphone, yet there is a large field in which that useful and inexpensive device can be used to excellent advantage. Recent improvements have so increased its efficiency that telegraphone circuits are successfully operated under conditions which have heretofore been prohibitive. Nearly every railroad has territory where the volume of traffic does not justify the expense of installing telephone train dispatching circuits, yet the improved communication afforded by telegraphones will so reduce op-


TELEGRAPHONE CIRCUITS.
St. Paul to Oelwein on No. 1 Wire.
St. Paul to Red Wing on No. 4 Wire.
Randolph to Mankato on No. 12 Wire.
Ground
Telegraph Switchboard
4P D T Switch
R — Relay
12 D — Choke Coil
18 A — Condenser
T — Telegraphone
H — Extension Howler
Normal Position Switches 1, 2, and 3 up.
To Connect St. Paul to Mankato, Throw Switch 1 Down.
To Connect Red Wing to Mankato, Throw Switch 2 Down.
To Connect Randolph, Telegraphone to Mankato and Howler.
To St. Paul-Red Wing, Throw Switch No. 3 Down.
Plugs in telegraph switchboard must always be as shown, except when wire chief or chief dispatcher orders them changed for test or patch. Wire chief can test for telegraph trouble caused by Telegraphone apparatus, by having Randolph operator cut out ontelegraph switchboard.

Switchboard Circuit.

erating expenses, that the installation would pay for itself in a few weeks.

The first extensive telegraphone installation on the Great Western was made on the western division. The only wires available were No. 8 iron with telegraph instruments cut in at every station. Circuits were established as follows: Clarion to Oelwein, 100 miles, with 5 telegraphone stations; Clarion to Hayfield, 100 miles, with 5 telegraphone stations; Clarion to Carroll, 80 miles, with 5 telegraphone stations; Carroll to Council Bluffs, 80 miles, with 4 telegraphone stations.

At Clarion, the three circuits are equipped with extension howlers and terminate in a jack box. Two instruments, one for the exclusive use of the dispatcher and one for general use, are provided. Either instrument may be used on any of the three circuits by plugging in at the jack box.

At Carroll, one telegraphone and one extension howler are so arranged that they may be transposed from one circuit to the other by means of a double pole, double throw switch.

Instruments were installed permanently in all cabooses, and portable telegraphones were furnished for passenger trains. The results obtained have been highly satisfactory. During the unprecedentedly severe weather of the past winter, the telegraphones proved veritable life savers. In every case of trains stalled in snow drifts or stopped by other causes, the conductor was in communication with the dispatcher in less than five minutes, and relief trains were started without delay. This meant not only saving in time, but saving in men, who otherwise would have been obliged to endure the exposure of tramping possibly five miles to a telegraph station during a blizzard with the thermometer 40 degrees below zero.

In several cases where the telegraph service was completely interrupted by crossed, broken and grounded wires, train orders were issued without difficulty by telegraphone to points beyond the interruptions.

Telegraphones have also proved of great benefit to the maintenance of way, mechanical and traffic departments, and have noticeably reduced the burden on the telegraph wires.

Circuits on the northern division were arranged as follows: 1, St. Paul to Red Wing, 58 miles No. 8 iron wire, 7 telegraphone stations; 2, St. Paul to Oelwein, 187 miles No. 10 copper wire, 4 telegraphone stations; 3, Red Wing to Rochester, 49 miles No. 8 iron wire, 3 telegraphone stations; 4, Randolph to Mankato, 67 miles No. 8 iron wire, 3 telegraphone stations.

The superintendent and dispatchers are located at St. Paul, and the assistant superintendent at Red Wing. Circuits 1 and 2 pass through Randolph and No. 4 terminates there. Switches are installed at that point by means of which either Red Wing or St. Paul are given direct telegraphone communication to Mankato without disturbing the telegraph circuits.

On the southern division pole line, there are from 15 to 18 duplexed and quadruplexed wires, and the inductive disturbance is so severe that standard telegraphones cannot be used for distances greater than fifty miles. The only wires available for telegraphone purposes are No. 8 iron, and over a large part of the division they have telegraph instruments at every station. To meet these conditions, a special telegraphone has been developed and has made possible the successful operation of the following circuits: Des Moines to Oelwein, 132 miles No. 8 iron wire, 4 telegraphone stations; Des Moines to Conception, 120 miles No. 8 iron wire, 4 telegraphone stations; Conception to St. Joseph, 40 miles No. 8 iron wire, 4 telegraphone stations; St. Joseph to Leavenworth, 34 miles No. 8 iron wire, 6 telegraphone stations.

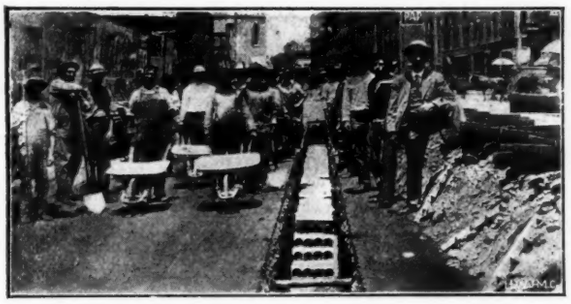
An experimental circuit, Des Moines to St. Joseph, 160 miles, of No. 8 iron wire with thirty intermediate telegraph offices on the wire, worked successfully. The special features of the new telegraphone consist of a high efficiency transmission device with push button, such as that used on telephone train dispatching circuits; also a double head telephone with a receiver for each ear, and an improved method of eliminating telegraph inductive disturbance from the receivers.

You Can Save Money

By Installing

J-M Fibre Conduit

"The Strongest Conduit Made"



The Southern California Edison Co., of Los Angeles, Cal., installing 50,000 feet of 3½-inch Style "J" J-M Fibre Conduit on North Los Angeles St., running underground from East Fourth St. to the Plaza, 15,000-volt cables to be used.

Present day engineering practice requires waterproof ducts in underground systems of distribution.

In addition to being waterproof, J-M Fibre Conduit is light in weight, thereby reducing the cost of freight, handling, hauling and installing.

Has a smooth bore and eliminates abrasions of the cable sheath.

Affords the best protection to the cables from stray currents and electrolitic action.

Furnished in socket, drive, sleeve and screw joint, together with fittings and bends to meet all conditions of service. Standard tubes two inches to four inches in diameter; fifty-four inches and sixty inches long. **Quick shipments.**

Write our nearest branch for full information and prices.

H. W. JOHNS-MANVILLE CO.

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Make Better Overhead Work

with the help of the Never Slip Grip. It grips the wire or strand so it can't slip out, and when the pull is increased it becomes wedged tighter into the Never Slip Grip.

Where Never Slip Grips have been used, you will find that overhead work is all O. K. and that there has been no time wasted in replacing wire in a grip that did not hold.

Learn more about the Never Slip Grip.

Ask any live jobber, or write us.

Union Electric Mfg. Co.

Pekin, Ill.

¾ Mile of Cable Saved from Ruin

One of the leading Indiana telephone companies built an expensive cable line

Almost a mile of it was continually giving trouble on account of crystallization caused by tapping of the branches of trees through which the line ran. The cost of constant repairing was so large and the service so poor that it was thought necessary to abandon this line and rebuild along another route.

Instead—they saved their line by installing Aerial Conduit. It is the one sure, inexpensive and thoroughly satisfactory way to protect cable where it runs through trees.

Learn about Aerial Conduit—perhaps it will save for you.

Aerial Conduit Co.

N. G. Hunter, Pres.

Wabash, Ind.

Practical Subjects—Letters and Discussions

Letters from an Old Timer to the New Troubleman.

Mr. Troubleman.

Dear Friend:—Sleeve grounds again! A very peculiar sleeve ground was one that bothered me for two or three days. Test would show a dead sleeve ground, but before we could get to the telephone it would clear. When we ran it down we found one of our desk stands was touching a Bell desk stand in a place where two sets were on the same desk. When the sets were separated, the line was clear, but touch them together and our line had a dead sleeve ground. The reason for this was that the ground side of the Bell line was connected to the frame of the desk stand and the sleeve side connection in our desk set touched the frame. This gave our frame sleeve current and the frame of the Bell stand carried our tip current. Therefore when the frame of our stand touched the Bell stand, our line was grounded.

When you look back and think of all the foolish things you have done looking for grounds it makes you laugh, doesn't it? Of course none of us does anything foolish now, we don't have to. That is to say, we don't have to tell about it. As a matter of fact there are few of us who don't want to kick ourselves after finding some trouble which has bothered us. Here is a trouble that happened some time ago, when I was not as wise as I am now. I got so tired and heartsore over it that I don't believe I will ever forget it.

On a 40-volt circuit, a line tested 35 volts sleeve ground. It was quite a long line and had but two telephones connected to it. It consisted of iron wires for about seven sections and then dropped off to a big chestnut tree about two feet in diameter and nearly 80 feet high and the wires were in the top of it. The iron wires went through to one telephone and twisted pair wire was tapped on in the tree, going to another telephone. There had been a thunder and lightning storm just before the trouble came on, so I thought the trouble surely was a tree ground. I first went over the line and removed wires from some suspicious places, but still the meter read 35 volts sleeve. I did not fancy the big chestnut tree so did not climb it.

I thought I would try the telephones next so I went to each instrument and got a test from the arrester with the fuses out, putting them back after each test. Every test that I made showed the same old 35 sleeve. Then I began to perspire, and the wire chief got impatient and things began to look blue. To make a long story short I hiked that big chestnut tree twice, and did every fool thing I could think of, and then some. Finally by sheer accident I got a test when both telephones were off the line, and my line showed clear. The trouble was that both condensers were short circuited and the current on the sleeve side of the line was going through them direct to ground, as both the telephones rang over the sleeve side, to ground, one high and the other low frequency.

What I should have done on this trouble, after I found that it did not cure readily, was to have taken both telephones off the line together. Then, if the ground was still on and a very difficult one to locate, I would have opened the sleeve side of my drop wire where it came off the line. If I got a clear test, I would have known the trouble was in the tree, if not, that it was between me and the cable box. In going to the cable box if I had found nothing on the line, I would have taken out the fuses. If a clear test resulted from there, then every inch of that line would have been examined. They cannot get away from you, even the smallest ground if you systemize your work. Block it out, cut it in squares; and make every square perfect. Then put the squares back in the block and you then have a perfect block.

Another one! a dead ground. The telephone was a desk instrument with the bell box on the wall. In the adjoining room some carpenters were at work. They had driven a nail through the partition, clear through the back of the bell box and condenser, making a dead short between sleeve and ground. A quick test for a grounded or short-circuited condenser is merely to take off the ground wire. If the trouble is in the condenser, you will clear the line.

Another line with a 65 per cent. ground had two drops off of it. I found the sleeve side and located the trouble in the loop or telephone. The drop wire looked clear, so I went to the telephone. I could talk to the wire chief indistinctly. With the ground wire disconnected I could not talk to him at all. So I went out to my drop wire and found the tip side of the line broken near the house. After repairing this, I went back to the telephone and found I could talk all right. Then I put my ground wire back, and got the ground again. This was another short circuited condenser, as at first I was talking grounded over the sleeve side of the line, the tip side of my drop wire being open.

My next letter to you will tell about some tip grounds.

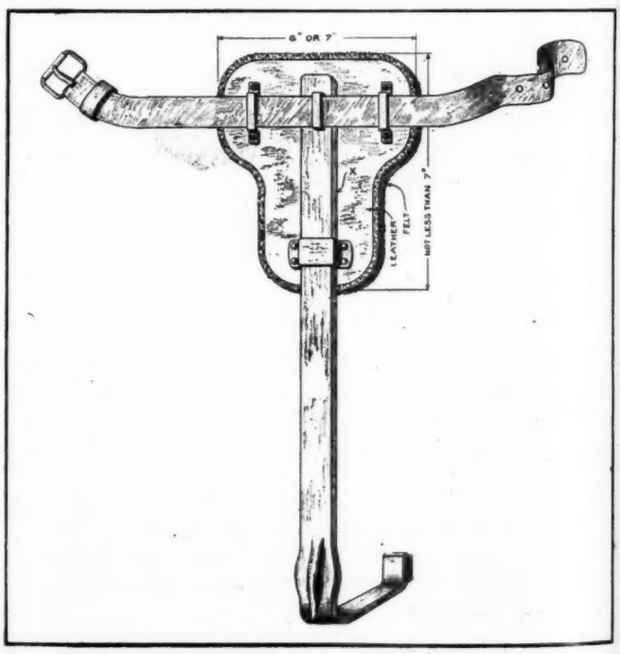
Yours very truly,

Fred Dewey.

A Pad for Linemen's Climbers.

A climber pad which really is a "pad" is shown in the accompanying drawing. Not one lineman in a dozen has a pad that really does what it should.

The part of the climber indicated by the X mark usually chaffs the calf of the leg, caused by the climber



A Climber Pad Which Gives Satisfaction.

turning slightly and pressing the edge against the leg. To avoid the chaffing it is necessary to extend the pad lower on the climber.

A dollar invested in a pair of these pads is well spent.

Etna Green, Ind. F. L. Whitaker.

GET HEMINGRAY GLASS INSULATORS

For Best Transmission

The teats on the petticoat, an exclusive feature of Hemingray Insulators, prevent water running to pins and causing grounds.

Hemingray Insulators are all insulation and are unusually free from breakage.

Write for Prices

Hemingray Glass Co.
Covington, Ky.

Factories: Muncie, Ind.

LET YOUR NEXT PURCHASE

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BROOKFIELD

INSULATORS

They have the QUALITY, the MECHANICAL STRENGTH and the ELECTRICAL EFFICIENCY that your insulators SHOULD have. It is real economy to use them on your High and Low voltage lines.

Brookfield Glass Co.

2 Rector Street New York

You will find our prices *very* attractive.

A big idea

Developed twenty years ago—proved to be instantly successful. It's inventor realized at once that he had achieved something destined to be important. But even though you would admit that the original model was very good—he wasn't exactly satisfied with it. He has devoted the entire past twenty years to its perfection. *He has succeeded.* Today it is doing a very important as well as economical service. That idea—*a big idea*—is the *1900 dry battery,* the achievement of Mr. Phillip Nungesser. If you are not using this battery, you should be. *Write for the reasons why.*

THE NUNGESSER CARBON & BATTERY CO.
2500 KING AVE., N. E.
Cleveland, O.

TRADE MARK REGISTERED
1900

Ask for batteries with this trade mark

Please tell the Advertiser you saw his Announcement in TELEPHONY.

Some Objections to Use of Duplex Pin.

In reply to C. E. Nicholas' communication in TELEPHONY of September 7, relative to the use of a special insulator on the lower end of a special pin, I wish to call attention to the following objections:

1. The lower wire would indeed be the "wet" side of the line unless an insulator with a petticoat above the wire were provided to break the water film between the pin and the wire.

2. If the tie wire on the lower wire breaks, the wire will foul the leads below, as there is no cross-arm to catch it.

3. Standard construction methods provide 18 inches between cross arms as a vertical spacing between wires. If this were reduced by putting two wires per pin, the sag would have to be very carefully regulated to prevent crosses. It is doubtful whether even then, crosses would not be frequent.

4. This form of construction cannot be used economically to increase the number of wires on a pole, as this is limited by the strength of the pole and by maintenance difficulties.

5. It is doubtful whether the increased cost of the special pin and insulator is not greater than the saving in cross arms.

Pittsburgh, Pa. Paul B. Findley.

A Combination of Trouble.

The other morning line No. 491 was reported noisy. On testing it was found that there was a slight short on the line. The short, being unsteady, caused the noise. This trouble was located in the pedestal cord. Replacing it left the line clear.

While away to dinner, the signal came in permanent. A test showed it to be due to a heavy short. Removing the heat coil, the short showed outside of the exchange.

The troubleman went to the subscriber's place of business and removed the fuses but could get no battery across the line. So he called in over another telephone stating that he had the line open. Still the test showed a short. Having a hot iron handy, we opened the line at *B*, where the cable is fanned out. Here we got the same test.

Before giving the outside line an O. K., we tested from

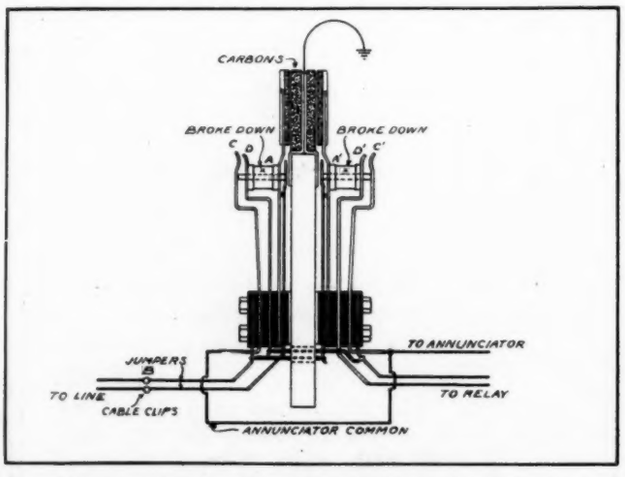


Diagram Showing How Heat Coils Caused Trouble.

the cable clips with an extra cord. The line showed clear until the fuses were replaced, when it again tested short. This was found to be a wet cord on an extension set and when replaced cleared up the outside line.

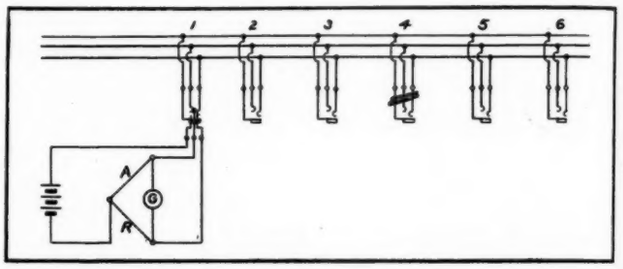
One will readily see from the diagram that the purpose of the springs *C* and *C'* is to sound the annunciator whenever the heat coil is in trouble. Because the external appearance of the heat coil did not indicate in a 140 pair strip, the heat coil which broke down internally, the battery to the annunciator was still left on the springs. When we removed the heat coil, the trouble appeared to be in the frame or jumper. Had it been a cross we would have thought of testing the heat coil, for we sometimes have such crosses; but never during four years had both on the same line broken down at the same time. Finally testing one of the coils of a circuit, we found it defective and then the other likewise.

Hence our second short was from spring *D* through the winding of heat coil *A* to the pin to spring *C* through the common of the annunciator to spring *C'*, through pin to the winding of coil *A'* to spring *D'*. This explains why whenever we remove a heat coil, we cleared the trouble. A case of two different shorts and in a new way.

J. W. Hache.

Locating Multiple Trouble with a Bridge.

With the bridge connected for the Murray loop test, as shown in diagram, use one end of the multiple. The bat-



Connections for Locating Multiple Trouble.

tery was cut off from the line in trouble and 100 ohms plugged in both *A* and *R*.

The trouble to be cleared was a tip and sleeve cross, starting in jack No. 2. A short circuit was put on the tip and ring by inserting a short circuited plug into the jack. The battery and galvanometer keys were closed, but there was a deflection of the needle. The same was noticed in jacks No. 3 and No. 4, but on plugging the short circuited plug into jack No. 5 a marked deflection was noticed which indicated that the trouble was between jacks No. 4 and No. 5. The trouble was found to be a piece of scrap wire across the jack terminal in jack No. 4.

From the formula it is easily seen why there was no deflection until the short circuited plug was placed beyond the fault.

Let r = total loop resistance.
R = rheostat reading.
A = bridge setting.
X = distance to fault.

Then when $R = 100$ and $A = 100$, $X = \frac{Rr}{R+A} = \frac{100r}{200} = \frac{1}{2}r$,

which is the distance from bridge to plug. All leads from the bridge to the jacks should be of the same resistance and as short as possible.

Galesburg, Ill. H. G. Patton.

Diamond State System Transferred.

An Elkton, Md., dispatch states that a deed has been filed for record in the office of the clerk of the court there by which all the property of the Diamond State Telephone Co., located on the eastern shore of Maryland, is transferred to the Chesapeake & Potomac Telephone Co., of Baltimore. The consideration named is $515,580.88, and the assumption of a mortgage of $500,000.

The Diamond State company was a subsidiary of the Bell system.

We Pay Your Repair Bills

Rather a startling statement, isn't it?

Let us tell you about it.

We have such positive knowledge that Chicago Telephones are trouble proof that we bind ourselves legally to pay all repair expense. We pay not only for materials required, but also for the time and expenses of your trouble man while he is going to and from the telephone, and while he is making the repair.

If the telephone is ten miles from your Exchange this expense item might be greater than the price of the telephone. We can afford to do this because the percentage of Chicago Telephones that ever need attention is negligible. During the year ending July 1, 1912, with six hundred thousand telephones in use, this trouble insurance cost us only $274.00.

No other telephone factory dares to duplicate this repair service because no other telephone is good enough to justify it.

Write for booklet entitled "Making Good."

Chicago Telephone Supply Co.
Makers of Telephones and Switchboards
Elkhart, Indiana, U.S.A.

NO. 260 CAN TOP TERMINAL

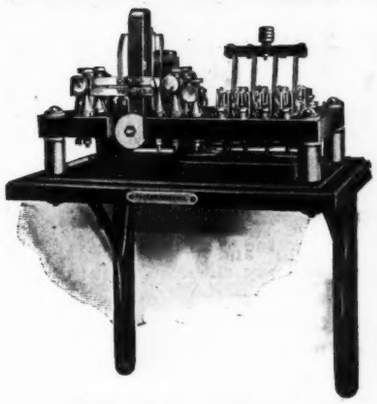
uses the ***unit type*** of ***protection*** either in ***long or short fuses,*** with or without carbon arresters. Made in two sizes, 10 to 30 pairs, and 20 to 60 pairs, and is the most flexible terminal ever devised.

The protection is mounted vertically on a circular iron framework, accommodating 10 and 20 pairs respectively, of protectors, and may be increased to 30 and 60 pairs by adding sections similar to the first installation.

No. 260
WITH OR WITHOUT POT-HEAD

Let us tell you about this and other ***"Sterling" protectors and terminals*** in our Bulletin No. 3.

LAFAYETTE ELECTRIC & MFG. CO.
LAFAYETTE, INDIANA



Buy a Pole Changer as You Would Your Overcoat

When "Mr. Prosperous-Looker" was asked why he always patronized a certain high-priced tailor, he replied:

"Mr. 'Tailor-Made' is a RELIABLE TAILOR. He has a good reputation.

HIS MATERIALS ARE RIGHT;

I've worn my last overcoat four years and there's not a hole in it yet.

HIS SERVICE IS RIGHT

He doesn't take orders beyond his capacity and let you wait until the "flowers are in bloom" before delivery.

HE IS UP-TO-DATE

There are no 1911 pattern books in his shop.

HE EMPLOYS EXPERT SHOP MEN

and so gives a perfect fit and finish.

Yes, he charges a little more but it's worth it when every garment he makes gives

YEARS OF SATISFACTION

to the user."

And the shabby "Mr. Ready-Made" smiled and understood.

When You Buy a Pole Changer

remember this argument of "Mr. Prosperous-Looker" and let us "tailor-make" it for you, because—

WE, TOO, ARE A RELIABLE FIRM,
WE ALSO ONLY USE THE BEST MATERIALS,
WE, TOO, GIVE PROMPT SERVICE,
WE HAVE UP-TO-DATE SHOP CONDITIONS
—NO ANTIQUATED TOOLS OR METHODS

and EVERY PIECE OF APPARATUS THAT WE MAKE GIVES YEARS OF SATISFACTORY SERVICE TO THE USER.

Write for Bulletin 20N9

THE HOLTZER-CABOT ELECTRIC CO.

BROOKLINE, MASS. AND CHICAGO, ILL.

My Duties as a Supervisor in a Moderate Size Exchange

This Paper Was Awarded First Prize by the New England Telephone & Telegraph Co. in a Contest for the Best Outline of the Duties and Responsibilities of a Supervisor—It Cover Many Points of Interest to Ambitious Operators

By Margaret E. McGee

I consider it my first duty as a supervisor to make myself an example for the operators by my attendance, general appearance and my enthusiasm in my work as a combination supervisor, part time local and toll.

On entering the operating room in the morning, my first duty is to note the attitude of the operators, and to make any necessary corrections. I see that the room is properly ventilated and lighted, that each position is provided with a pencil, tickets sufficient for the day's work, that the clocks have been properly regulated and show correct time, and that the telephone sets are disinfected. The most efficient operators I place on the most heavily loaded positions; and if any are absent, inquire if time has been filled, if not, do so at once.

I next report to the wire chief the troubles received the previous evening. I go over the board for poor jack markers, number plates, uncapped trouble cords, sticky keys, etc., reporting each to its proper department. If I find they are not attended to, the chief operator is notified.

Each morning the service test of the previous day is taken up, the operators being coached on the weaker points, and encouraged to keep up the good work being done on the others. I take one or more of the phrases up with each operator every day, thereby keeping them familiar with each one. I endeavor to answer each question asked me by the operators correctly, and in such a manner that they clearly understand my meaning. If ever in doubt as to an answer, I always make sure by looking it up, rather than give a doubtful one. I see that the reliefs are started and finished at the appointed time. Several times each day the windows are opened for about five minutes, and the operators stand to inhale the fresh air.

In our exchange the supervisors are given a half hour each morning and afternoon from duties on the floor. This time is spent in various ways. Some mornings I listen in with the operators, using some central position, so as to command a view of the entire board. Again, from the chief operator's desk, I listen in for a repetition. Perhaps there is some operator who is weak on certain points; I use this time to coach her, the operator usually being very grateful to me for using this time for her benefit. Then there is the student who takes such an interest in the work, and whom, therefore, it is a real pleasure to teach. Some mornings I go over my rules, so that they may be fresh in my own mind, or I may study up on some topic which is not required of us, but in which I have become interested.

I encourage the operators to report all irregularities noticed both in this and other exchanges, the latter being taken up with the chief operator, not in the form of a criticism, but that they may be rectified.

The tickets I collect each hour, looking over each for wrong rates, neatness, etc., the number being verified at the information desk. When a ticket is not made out as neatly as I wish, it is taken back to the operator, together with a satisfactory one, so that the operator may notice the difference. This rarely happens to the same operator more than twice.

When the traffic is light, as happens oftentimes in the evening, I time the operators on supervision and "don't answer" intervals, using the cord test line for ringing for the purpose. A check is also made for pegging, Veeder counters being placed on several positions, the supervisor checking from the desk, taking the operators one at a time. Before peg count day I satisfy myself that each operator understands how and when to peg, each one being cautioned as to over- and underpegging, and that the importance of the peg count is thoroughly understood by all. During the day, operators are checked on pegging from the desk by supervisor or chief operator.

The greater number of the "emergencies" are handled by the supervisor and are recorded in the log book for future reference. A few days ago I was connected with a calling subscriber who was talking so excitedly that the operator could not understand her. She asked to have the fire department sent to her address, as the barn was burning fast. I notified the nearest fire station, and the firemen were soon on their way, having almost reached there when the alarm was ringing. The next day the subscriber extended her thanks.

A few days ago I received an "emergency" call from one of our local restaurants; a patron while going down the stairs had fallen and was rendered unconscious. The clerk, not knowing how badly he was hurt, wished a doctor immediately. The nearest doctor being out of town, several others were tried in quick succession, and in a short time one was on his way. The clerk having told me he was alone in the shop, I called him a little later, thinking I might be of further assistance. He was very grateful, and told me the man had recovered shortly after the arrival of the doctor.

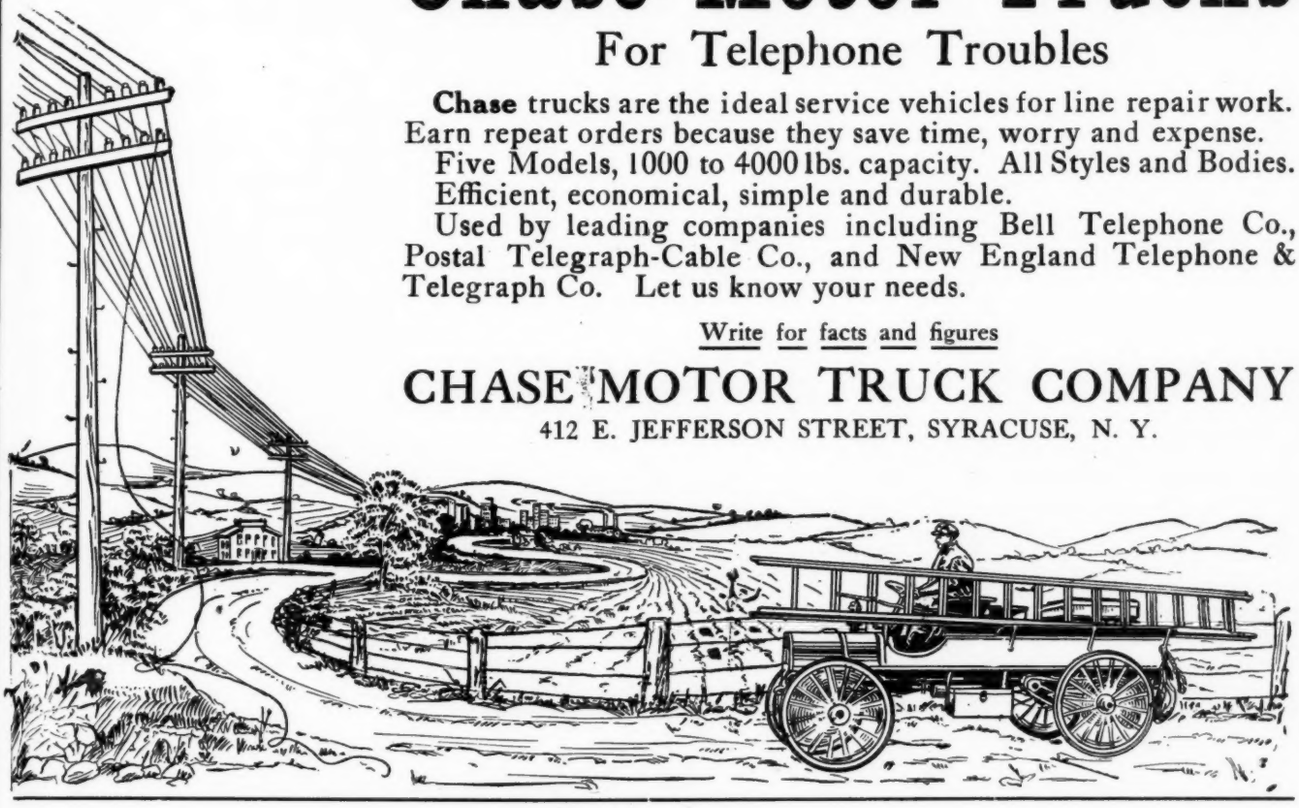
One of the many questions asked me by local operators is: A subscriber gives an A-B call, and the called party does not answer; he requests the operator to call him. The ticket is sent to a special or delayed operator to be completed. If the subscriber should call and ask her to try his call again, what would she say? Not being able to find any given rule on the subject, I told the operator to tell her subscriber she would connect him with the supervisor, and would make connection after having given the supervisor an outline of the call. I also told the operator that as there was no rule covering it, I would refer it to the chief operator, who would advise me if a special ruling should be made.

When I am on duty as a toll supervisor, I begin by inspecting the calculagraphs for correct stamping and timing, make note of all equipment troubles, also neatly arrange the books and cards on the board. The circuits are tested out each morning by the wire chief, and a report of those out of order is given to me. These are recorded in the book and reported to the distant chief operator. Each day at 8 a. m. and again at 5 p. m. the correct time is given to the other offices in the district. The weather report is also given each day to these exchanges.

Each morning, after summarizing and comparing the observations, I take them up with the operators. The items and averages are compared with those of previous

Chase Motor Trucks

For Telephone Troubles



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Five Models, 1000 to 4000 lbs. capacity. All Styles and Bodies.

Efficient, economical, simple and durable.

Used by leading companies including Bell Telephone Co., Postal Telegraph-Cable Co., and New England Telephone & Telegraph Co. Let us know your needs.

Write for facts and figures

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OUR QUALIFICATIONS—Largest plant in the world, finest equipment procurable, thirty years' experience.

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INSULATE SHELL ENLIGHTENING THE TELEPHONE TRADE

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The foremost Telephone Manufacturers everywhere use the "INSULATE" products.

Manufacturers of TELEPHONE RECEIVER CASES, MOUTH PIECES, HANDLES, KNOBS, SWITCHBOARD TERMINALS, ELECTRICAL INSULATIONS for all Purposes

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Gentlemen:

Please send us samples and quotations on following "INSULATE" goods.....

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days, the operators being coached and encouraged in the work. The irregularities of the other exchanges are reported to the chief operators. I also go over the lost call record every day. The tickets I collect ever hour, going over them thoroughly for errors and filing them in the cabinet.

We are often questioned regarding reduced rate charges. Many people cannot understand why they should be charged when they have not talked. A few days ago a party gave a call to Boston, and received the report that the man was out of town for the day. The calling party could not understand why he should pay anything. I told him that a Boston wire is valued at $30,000, or 40 cents per minute. As we used the circuit to get this information for him, thus delaying other calls to do so, we felt we should be recompensed by a small part of the regular charge. The party then said, "Well, if that is the case I am getting out of it easy for 40 cents," and then deposited the money.

I recall another case where a party refused to pay a reduced charge. He said, "It is just the same as though I went into a store intending to buy a suit of clothes, but, deciding not to do so, was charged for looking them over." I replied, "If you are going to make that comparison, we will put it this way: If you went into a store intending to buy a suit, but you bought a coat only, you would expect to pay for the coat, wouldn't you?" The party said: "That is right; I never thought of that before." By thinking of arguments a satisfactory reply can be given.

The question is often asked by subscribers, Why are we not allowed to ask for a particular party on a 10-cent rate? I always explain that we are giving the lowest rate possible, and if we had to use the circuit to get particular information we would have to charge a higher rate for talking. The parties are usually satisfied with this explanation.

Parties often dispute over time. I explain our method of timing by a stamp, how the exact number of minutes and records are plainly stamped on the ticket, also ask them if they realize how quickly time passes when one is talking. As a rule they are satisfied with this, but if they persist in feeling they have been overtimed, I ask the party called if they have any idea of the length of time they talked. If he thinks they talked the same amount of time as we have on the ticket, the calling party is usually convinced that we are right. If the circuit is noisy or people interfere on the lines, or for any other good reason the conversation is interrupted, I always make an allowance in the time. I never let a subscriber leave the telephone dissatisfied.

In my dealings with the operators I have endeavored not to become too friendly, or to go to the other extreme. In taking things up, I strive, above all things, to be just, taking things up in such a manner that the operator understands it is for her benefit—that is, by pointing out their weakness, they may become expert in their work.

Before leaving the office at night I assure myself that the ringing power is O.K., attend to the ventilation, etc., and leave the room in charge of the senior operator.

To Lower Rates in Boise, Idaho.

The new city commissioners of Boise, Idaho, have drafted ordinances which will reduce the rate on a two-party telephone from $2.00 to $1.50 per month, and a one-party line from $2.50 to $2.00 per month.

Would Force Company to Get Franchise.

The Ottumwa (Iowa) Commercial Association by unanimous vote recently adopted a resolution requesting the city council to bring ouster proceedings against the Iowa Telephone Co., or to compel the company to secure a new franchise by popular vote.

Queries on Theory and Practice

The Pitting of Pole Changer Contacts.

In operating a pole changer in our exchange, it is found that the platinum contacts of the vibrator, both at the pole changer contacts and at the vibrator contacts, give considerable trouble through one side appearing to become larger and the other side pitted.

Is there any way in which this effect can be overcome? Filing the contacts does not prevent the difficulty from appearing again. Can anything be done to eliminate the difficulty?

Reversing the battery supply to the machine prevents the unequal pitting and building up of the contacts. Insert a reversing switch in connection with the battery leads to the pole changer, and use it to reverse the battery at least once every two or three days. Carefully clean the contacts after installing the switch and you will undoubtedly have but little trouble of this nature.

Removing Sediment from Storage Battery Cells.

What is the proper method to use when cleaning the sediment from storage battery?

The sediment in small cells where glass jars are used, can be most easily removed by carefully drawing off the electrolyte without disturbing the sediment, thus leaving the jar free to be cleaned. This cleaning should be done directly after an overcharge and the plates and electrolyte should be replaced in the jar as soon as possible in order that the plates may not become dry.

With large plates in wooden tanks, a scoop specially made for the purpose, should be used to remove the sediment. It is preferable to clean this style of tank just before an overcharge.

The sediment should be removed from the storage battery cells whenever it reaches within one-half inch of the bottom of the plates. Should it be allowed to reach the bottom of the plates, it would cause a short circuit between them. For this reason the sediment deposit should be carefully watched.

Measuring for Grounds on Party Lines.

We would like to know if a ground on a party line can be located with a Wheatstone bridge without sending out a troubleman to put a short on the line. The telephones are of the 1,600-ohm bridging type on a six mile, No. 12 iron metallic circuit. There are 13 telephone sets connected to the line.

If, as is usual, the bells are bridged across the line without condensers, it is practically impossible to locate a ground even if you use the Varley loop test and the short circuit.

The only satisfactory way to handle it from the office without the aid of a lineman is to measure from the faulty wire to earth. If the leak is heavy, amounting to a dead ground, and you know the resistance per mile of the wire, you can locate it fairly closely. Take a reading of resistance, reverse the line and ground terminals on the bridge, and take another reading of resistance. Take the mean or average of these two values. This is to neutralize the effects of possible earth current.

BLACK DIAMOND

FRICTION TAPE

Perfect adhesion—improves with age. Not gummy. The same in all climates. Guaranteed for one year.

NOKORODE

Solders all metals except aluminum—makes soldering easy and permanent.

Nokorode is made as carefully as a druggist fills a prescription.

Nokorode will not turn your work green or eat off the joints.

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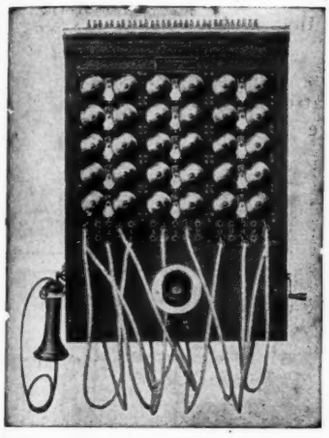
Nokorode Soldering Paste and Salts, Black Diamond Friction Tapes, Uncoated Armature Tapes, Sleevings, Red Rope Paper, Press Boards and Hose.



The Andrae Switchboard No. 110 is Troubleproof and Efficient

This is the perfect board for rural line use, It has all the superior features of our larger boards including a special heavy 5-bar switchboard generator, adjustable long distance transmitter, long distance receiver with operator's cord and plug, duplicate jacks with indicating bells. One extra pair of connecting cords and plugs furnished with each five bells. This is a very convenient and popular little board and is highly indorsed by managers of rural lines throughout the United States. It is first class in every respect and guaranteed electrically and mechanically perfect.

It is made to stand much hard use and to give economical and satisfactory service without any trouble. Write today for full particulars of the Andrae Switchboard No. 110.

JULIUS ANDRAE & SONS CO., 358 Broadway, Milwaukee, Wis.

Beck Bros.

Manufacturers of Electrical Testing and Measuring Apparatus

Send for Literature

210 N. 2nd St. Philadelphia, Pa.

L & N Lineman's Fault Finder

THE LEEDS & NORTHRUP CO.
4901 Stenton Avenue, PHILADELPHIA

¶ The **L. & N. Portable Testing Sets** are convenient instruments for the measurement of resistances and the location of faults. Our Lineman's Fault Finder is a simple, reliable and inexpensive instrument for these purposes. May be used for locating faults, crosses, opens, etc., on telegraph and telephone lines. Also for measuring conductor and insulation resistance.

May we send you details?

Electrical Measuring Instruments

Please tell the Advertiser you saw his Announcement in TELEPHONY.

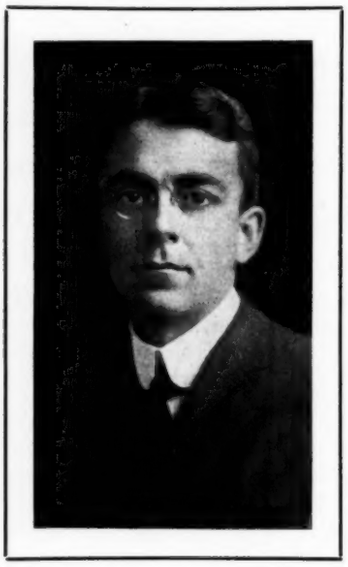
From Factory and Salesroom

Convention: Western Pennsylvania Independent Telephone Association, Cambridge Springs, October 10-11

Automatic Telephone Co. Enters Railroad Field.

The Automatic Electric Co., Chicago, Ill., has entered the railroad telephone field and plans on handling all supplies in the electric line used by railroads.

To introduce this new line, it has engaged the services of John H. Finley who has been handling a similar line for the



John H. Finley.

Western Electric Co. for the past four years. Mr. Finley has had a training which should fit him to be of service both to the Automatic Electric Co. and to the railroads. He is a graduate of Sheffield Scientific School of Yale University, class of '99. He has had a wide experience in the telephone business, having been employed for the past 13 years in various capacities by the Western Electric Co.

He entered this service in August, 1899, and took up shop, installing and engineering work before entering upon sales work.

Mr. Finley will direct his energies very largely to the private branch exchange feature of the railroad situation, it being his belief that it would be possible to very materially reduce the cost of operation of these exchanges in railroad shops, offices and yards, and at the same time increase the efficiency of the telephone system as a whole.

With the new selector and a complete line of telephones and supplies as an adjunct, there is a wide field opened up for successful competition and the many friends of Mr. Finley wish him all success in his new field of activities. During the past few years, Mr. Finley has become well known to railroad men and has made many warm friends among them by his methods of fair dealing and reliability of his information regarding the equipment he sold. The Automatic Electric Co. is to be congratulated upon obtaining the services of Mr. Finley for its new railroad department.

Paragraphs.

The Jewell Electrical Instrument Co., Chicago, has just issued a circular descriptive of its pocket portable testing outfit. The outfit was placed on the market only a few months ago and is especially designed for the use of telephone and telegraph companies.

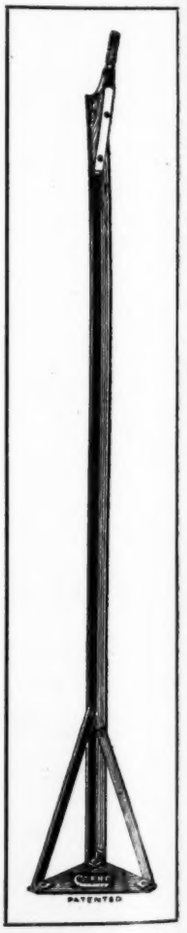
The Nungesser Carbon & Battery Co. of Cleveland, Ohio, has just issued a folder telling of the saving possible by the use of the "1900 Dry Battery." It is claimed that these batteries save 15 cents on every dollar invested and the folder contains some interesting facts bearing on this claim.

Hall L. Brooks, of the Hall L. Brooks Co., of Tomahawk, Wis., producer of cedar products, is making an extended business trip through the South. Mr. Brooks reports considerable activity in his line. The Brooks company, while carrying a large stock of cedar poles, of all sizes, is making a specialty of 20 and 25-ft. poles.

The Automatic Electric Co., of Chicago, has received an order from the Cuban Telephone Co. for 800 lines of automatic telephone equipment which is to be installed in Matanzas. This order is in line with the general policy of the Cuban Telephone Co. to ultimately make Cuba all automatic.

Recent Designs of Telephone Poles.

The ever increasing demand for poles and the decreasing available supply of cedar has caused many to wonder where the poles of the future are going to come from and of what material they will be made. Concrete and steel poles of many different styles have been introduced and have met with success abroad.



Carbo Steel Pole.

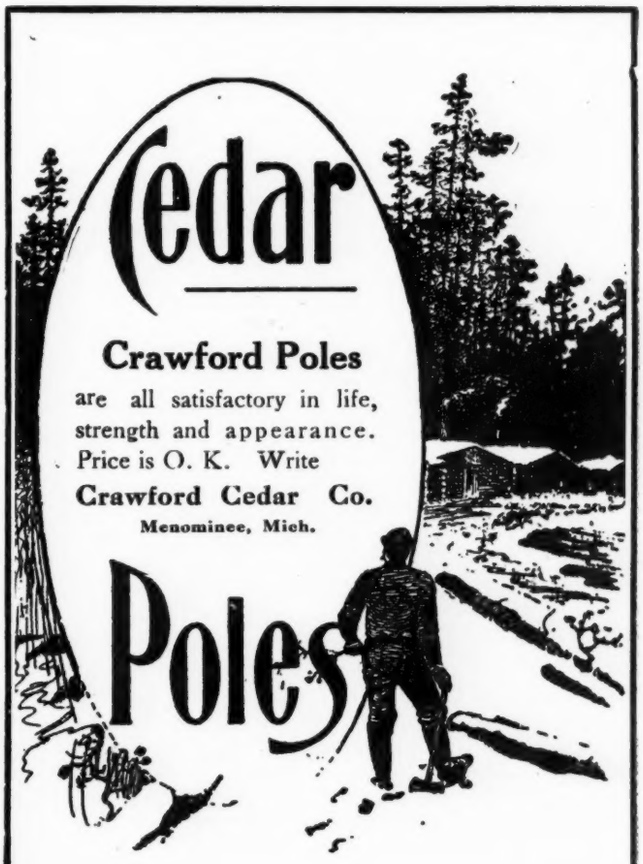
The newest entry into the field of manufactured poles is the Carbo steel pole manufactured by the Carbo Steel Post Co., of Chicago Heights, Ill. This pole is new inasmuch as it is just being introduced to the telephone, telegraph and electrical field. It has been tested and developed for some years past and is now advanced as a pole having all desirable features. The design is said to be strictly in accordance with the best engineering practice relative to the strains or stresses of the material used.

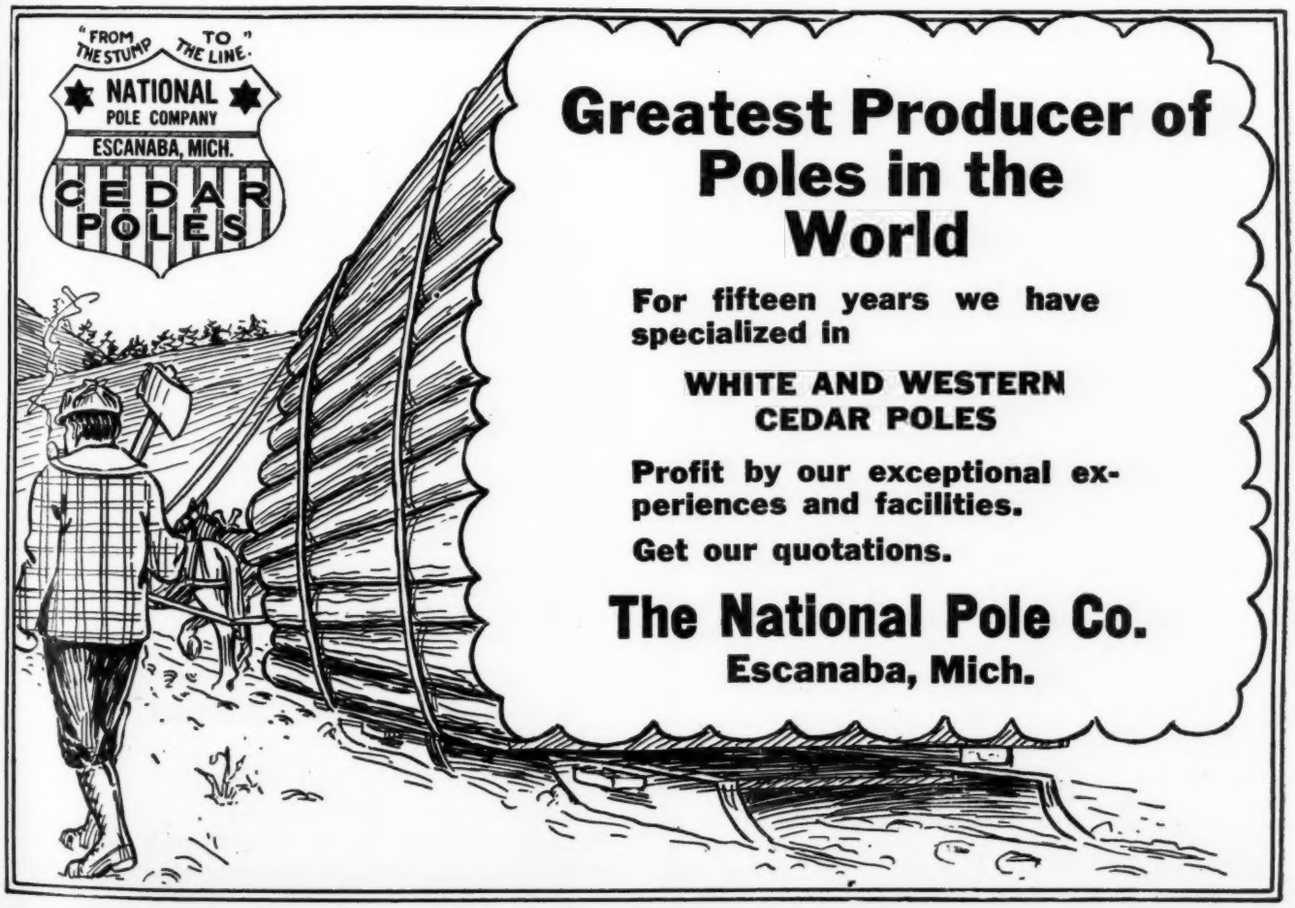
Attention is specially directed to the base of the Carbo steel pole as it is claimed that it affords an ideal anchorage without the use of concrete. Some of the advantages which the company sets forth in favor of these poles are: The first cost is considerably cheaper than wood and that feature alone is doing much toward effecting its extensive adoption. The maintenance is less than one seventh that of wood, being about 1 per cent. The life is at least fifty years and when the pole is finally replaced it has a good scrap value.

The Carbo steel pole is manufactured in uniped or biped styles. Poles up to twenty feet are of the uniped style and for greater heights the biped style is used. In some cases where it is demanded that the upper part of the pole be wood, the Carbo composite style may be used. One feature that will appeal to the telephone company considering the adoption of Carbo steel poles is the ease of transportation. They are shipped so that they nest and a great many can be placed in a car or wagon. Some of the other claims advanced are that Carbo steel poles are dry-rot-, lightning- and insect-proof; they do not permit any current leakage; they save the cut-

CEDAR
NORTHERN POLES WESTERN
We are pioneers in the butt-treatment of poles using Creo-Wood Preserver. Write us.
THE VALENTINE-CLARK COMPANY
MINNEAPOLIS, MINN.
Western Sales Office: St. Maries, Idaho

NAUGLE
Pole & Tie Co.
5 South Wabash Ave.
Chicago, Illinois
The Trinity in Poles
"Service—
Price—
Quality."
POLES




"FROM THE STUMP TO THE LINE."
NATIONAL POLE COMPANY
ESCANABA, MICH.
CEDAR POLES
Greatest Producer of Poles in the World
For fifteen years we have specialized in
WHITE AND WESTERN CEDAR POLES
Profit by our exceptional experiences and facilities.
Get our quotations.
The National Pole Co.
Escanaba, Mich.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

ting of gains, placing of steps and digging of big holes; they are simple and dignified; and a line of Carbo steel poles is about as good looking and inexpensive a line as could be desired.

It is evidently to the interest of telephone men to investigate the Carbo steel pole. All information and requests for estimates will be promptly furnished by the manufacturers.

New Purchasing Agent for Cracraft, Leich.

The Cracraft, Leich Electric Co., of Genoa, Ill., has just appointed V. S. McNutt its purchasing agent. Mr. McNutt connected himself with the Cracraft, Leich company in the early part of 1910, and has been, for the last two years, covering the Indiana territory as salesman for that organization.

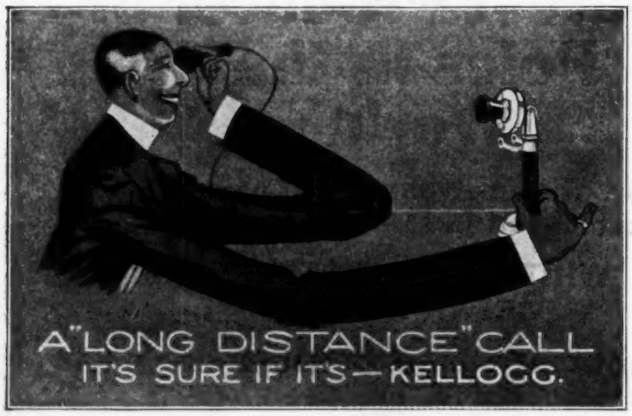
V. S. McNutt.

He entered the telephone business in 1903, in the employ of the Indianapolis Telephone Co., as wire chief and troubleman. In 1906 he went with the Chicago Telephone Co., in the capacity of equipment engineer. Two years later he accepted a position in the sales department of the Western Electric Co., where he continued two years. His inclinations and sympathy lying with the Independent field, Mr. McNutt, as stated, affiliated himself with the selling end of the Cracraft, Leich company. His experience has been of a character to well adapt him for his present important office of purchasing agent.

Kellogg Long Distance.

A "Long Distance" call as illustrated on this page is another popular Kellogg card that is being distributed this month. On the reverse side is the following, very much to the point description of the Kellogg long distance service:

"A Long Distance Call." Spoken to even the oldest, most prosaic telephone man, these words cause instant attention. To



A Card to Attract and Hold Attention.

the average subscriber, they cause immediate thrills of anticipation and mental speculation.

Long distance calls are serious—vital. They have made and unmade men and business.

"Long Distance" has supplanted much typewriting and saved the S. D. Messenger many a trip.

It is, for many purposes and circumstances, supplanting the telegraph.

"Long Live Long Distance!" But remember,

"The Service of the Telephone Proves the Worth of the Line."

(It's Sure if it's Kellogg.)

The Kellogg Switchboard & Supply Co., of Chicago, will gladly mail these cards to all interested.

New Soundproof Telephone Booths in Europe.

Soundproof telephone booths are now constructed by a German firm, says a writer in L'Electricien, of Paris. Owing to a new principle which is used in their makeup, it is said that not the least sound can escape from them while the telephone is being used. The walls of the new booth are built of five layers of thin wood, with the grain crossed each time, and the layers are glued together. The whole is then covered with a special soundproof compound, so that in this way it is not required to use deadening cushions as a lining for the booth. As the whole is made in six dismountable panels, a booth can be set up in a very short time, and the panels are not too large to be taken in through an ordinary door. Insulated openings are left in the partitions beforehand, so that there is no need of boring holes in order to put in telephone or electric light wires.

More Federal New Construction.

As soon as the material is received, work will be commenced by the Federal Telephone & Telegraph Co., of Buffalo, N. Y. on the construction of five local circuits along the lake shore between Wanakah and North Evans. These circuits will be connected to the Hamburg exchange. The demand for Federal service has been so great as to completely absorb all the company's present facilities in that section,—making these additional circuits necessary to properly handle the business.

At Franklinville, the Federal company is constructing a number of local subscribers' lines and placing additional crossarms. These circuits are being placed for the purpose of relieving some of the local lines which are at present congested, and to provide additional facilities for taking care of a number of new subscribers, who have contracted for the service.

This Federal exchange was started in 1895, by Virgil Hayden, superintendent of the Buffalo exchange. The company started with a short local line connecting a few business houses and residences, and has had a continued and steady growth from its beginning until today. It now has upwards of 280 subscribers.

About a year ago the exchange was moved to larger and more commodious quarters, the outside plant being practically rebuilt. Since then, the business has been increasing to such an extent that the company has found it necessary to further increase its facilities.

Poor Service Following Merger.

The Independent telephone company in Birmingham, Ala., was recently taken over by the Southern Bell company. Commenting on the situation since the merger, the News, of that city, says:

"Complaint has become almost universal among the local patrons of the Southern Bell Telephone Co. of the poor service now being rendered by that corporation.

At the time permission was given the Southern Bell to advance its rates, a solemn promise of adequate service was made. This promise was reiterated at the time the Southern Bell took over the physical equipment of the People's Home company. If trust had not been put in those protestations, there would have been a violent objection from the people over the consummation of either move.

Instead of getting better, the service has grown steadily worse. Various excuses have been offered by the company for its failure to give what its patrons pay for, but there has as yet occurred no appreciable remedying of conditions admittedly bad.

It is time for the Southern Bell to effect reform. If it fails to do so in the very near future, the city commission should take a hand and see what can be done in the interests of the people."

Southern Bell Earnings.

The Southern Bell Telephone & Telegraph Co. reports to the New York Stock Exchange for the year ended June 30, 1912, total receipts of $7,571,402; net earnings of $2,484,195; balance after charges, $1,851,674; and surplus, $567,674.

WHITE CEDAR POLES

We handle just the poles for your purposes—the kind that you can depend upon to give service.

We are producers of poles—not jobbers. Consequently reasonable prices.

Let us quote you on your next order.

KAYE & CARTER, 1043 Lumber Exchange Bldg., Minneapolis, Minn.

PRODUCERS OF QUALITY CEDAR POLES

WE PRODUCE OUR STOCK THEREBY GIVING YOU THE BEST THAT GROWS

GIVE US A TRIAL ORDER.

TRI-STATE CEDAR CO.
COEUR-D'ALENE, IDAHO

Warehouse: Brookport Ill. LONG LEAF Mills: Corinth and Ripley, Miss.

YELLOW PINE CROSS ARMS

Ship in any Quantity. Standard and Special Sizes.

SOUTHERN PINE MFG. CO., PADUCAH, KY.

We Want Your Pole Orders

QUALITY? Idaho, Michigan and Canadian Cedar. The Best that grow.
PRICES? Remarkably reasonable!
SERVICE? Immediate shipments—any quantity! Poles in *stock* We produce our own.

No matter where you are, our yard locations and shipping facilities make it possible to reach you in a hurry.

THE F. BISSELL COMPANY, Toledo, Ohio.

CEDAR POLES

We have a fine lot of poles.
Our poles are strong and tough—the kind you need for long service.

LET US SEND QUOTATIONS TODAY

PERLEY LOWE & COMPANY
1458 McCormick Bldg. :: CHICAGO

W. C. STERLING & SON CO.

POLES OF STERLING QUALITY

Oldest Cedar Pole Firm in Business Producers for 32 Years

MICHIGAN WHITE CEDAR

W. C. STERLING & SON COMPANY

1880 MONROE, MICHIGAN 1912

White Cedar Poles

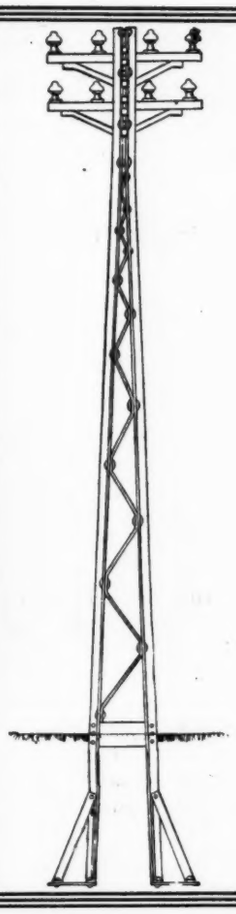
C. H. WORCESTER CO.
CHICAGO

Oldest in the business.

POLES and CROSS ARMS

Prompt Shipments
Lowest Prices—Write

WM. MUELLER & Co. 920 Postal Teleg. Bldg.
Established 1862 CHICAGO



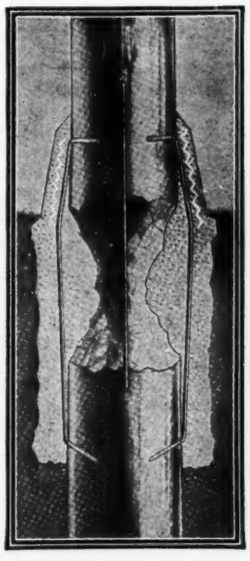
Before You Buy Another Pole — Learn About Carbo Steel Poles

Many tests have proven that they are easily best for telephone use. Carbo Steel Poles are cheaper than wooden poles in first cost, their maintenance is about one per cent a year. Compare this with wood at 7½ per cent. They last fifty years and still have a good scrap value; treated wood lasts but twenty years.

Carbo Steel Poles stand the most severe strains of wind, ice and heavy lines. They haven't the excessive weight and size that makes wooden poles subject to frequent failures.

Carbo Steel Poles are strong, light and inexpensive. It is worth a lot to you to learn about them now.

CARBO STEEL POST CO.
Chicago Heights, Ill.



OLD POLES MADE NEW

You can double the life of your old poles by using the

Orr Reinforcement

No New Poles to Buy
No Interrupted Service
No Wires to Change

The Cost Averages About One-Third Your Renewal Cost

We shall be glad to send you a copy of our book on Pole Reinforcing, which gives detailed information.

WRITE TODAY

Pittsburgh Reinforcing Pole Co.

435 Sixth Avenue, Pittsburgh, Pa.

Legal Cases and Decisions

By A. H. McMillan

Construction in Rural Districts.

"Will you please tell us the law in regard to telephone construction in the rural districts and in towns of 5,000. We are going to have some trouble and want to know just where we stand. Any information you can possibly give us along this line will be greatly appreciated."

You do not state what particular question of law in connection with telephone construction in the rural districts you wish to be advised about. A safe rule for construction is to so build your lines that they will not interfere with the rights of any one else. Another rule to be observed is that poles must not interfere with public travel and must be set and located with reasonable care to prevent injury to travelers and other persons lawfully using the highway. The poles must be strong, stable and secure and must be high enough above the highway to be safe for all ordinary travelers and vehicles to pass underneath.

Over private lands you cannot build without permission of the land owner. If he wishes an unreasonable compensation, you may be able to condemn a right of way. The poles should be set so as not to interfere with ingress and egress, light and air of the abutting owner. Permission from the proper public authorities should be obtained to use the streets and public grounds. We will be glad to answer more definitely any specific question you wish to ask.

Duration of Franchise.

"I send you a copy of our franchise and minutes of its record on the town book. There is some question as to the life of this franchise by the council. It thinks it can terminate it at any time and is asking that we get a new franchise. Kindly look this matter over and give us your opinion."

The franchise in question is in ordinary form but there is no date for its expiration. The last section is as follows: "Whereas, an emergency exists for the immediate taking effect of this ordinance, it shall take effect and be in force from and after its passage."

It has been held that when an ordinance granting a franchise states no period for which it shall exist, it is presumed to be for the life of the corporation. Govin vs. Chicago, 132 Federal, 848. McMillan on Telephone Law, Section 70.

Under this ruling the franchise, if validly passed, would be in force so long as your corporate existence lasts. We presume that the terms of the franchise were complied with by the filing with the town clerk of a written acceptance and also a bond of $500 conditioned for the performance of the required conditions and that said bond was approved by the board of trustees of the town.

You also state that the franchise was assigned by the grantee to another corporation and send us an extract from the minutes showing the transaction. The United States Supreme Court holds that a franchise is a contract between the grantor and the grantee by which the latter undertakes to perform certain public duties, from the performance of which he cannot release himself without the consent of the other contracting party. Thomas vs. Railroad Company, 101 United States, 83.

In accordance with this doctrine, the franchise can be transferred only with the consent of the authority which granted it. This authority, I presume, you did not get. However, in the states of Wisconsin and Michigan, the authorities hold that franchises may be assigned. Michigan Telephone Co. vs. St. Joseph, 121 Mich., 502; Badger Telephone Co. vs. Wolf River Telephone Co. (Wis.), 97 Northwestern, 907. McMillan on Telephone Law, Section 71. We do not know of any express decision by the courts of Indiana on the subject of the transfer of franchises, but think the courts would be likely to hold a transfer valid. In this case we do not see any reason why the franchise you have should not be valid and irrevocable so long as its terms are complied with.

Neighborhood Telephone Exchange.

A number of persons associated for the purpose of building a neighborhood telephone exchange, the association never having any capital or shares of stock, and not being organized for profit. It had by-laws for admitting new members but not for dismissing members who were in default.

A large number of the members of this association desired to secure better service and withdrew from the association in question which was known as "The Waldron Telephone Exchange," and organized a corporation known as "Hillsdale County Telephone Co." To this latter corporation, they transferred their interest in the voluntary association, claiming to be a majority of the members thereof. The seceding members wished to consolidate the property and service of the voluntary association with that of the corporation.

The Supreme Court of Michigan held that the original association was a joint adventure and that the seceding members, even if partners, could not forcibly dispossess those in possession or authorize the corporation, by making it their assignee, to do so. Moore vs. Hillsdale County Telephone Co., 137 Northwestern, 241.

Disclosing Contents of Message.

The penal code of California (sec. 619) makes it an offense to willfully disclose the contents of a telegraphic or telephonic message addressed to another person without permission, unless directed to do so by an order of the court. Altering the meaning of a telegraphic or telephonic message and opening any sealed message with the purpose of learning its contents, is also made an offense.

In a prosecution against a resident of Catalina Island for publishing the contents of a wireless telegraph message in a Los Angeles paper, it was held that the offense denounced by the first section above mentioned was that of disclosure by persons engaged in the transmission of messages, not by ordinary individuals who, through innocent means learned of their contents. People vs. Earl, 124 Pacific, 887.

Discovering and Removing Crossed Wires.

The wire of a telephone company came in contact with a charged wire of an electric company. The trouble was discovered and the vice-president and manager of the electric company directed company employes to locate and remove the cross, and to have the current turned on when in their judgment the wires were clear. Under the circumstances any negligence of the employes so notified was held to be the negligence of the company, so as to render it liable for death of an employe of the telephone company, proximately caused by such negligence. Clebourne Electric & Gas Co. vs. McCoy, 149 Southwestern, 534.

Use of Ladder to Climb Poles.

Where a telephone company was guilty of negligence in furnishing a defective pole, and its lineman neither knew of the defect before it broke with him nor had any instruction to use a ladder in ascending the poles, instead of climbing them, he did not assume the risk of injury while climbing the pole in a careful manner with a ladder. Abilene Light & Water Co. vs. Robinson, 146 Southwestern, 1052.

Compelled to Furnish Service.

A telephone company operating under the authority of the state of Kansas and under a franchise granted by the city of Independence, Kan., is held to be a public service corporation. Its duty to the public is said to result from a public trust and station, and the performance thereof may be compelled by a writ of mandamus from the district court. Under this holding the Kansas City Long Distance Telephone Co. was required to install a telephone for a would-be subscriber. Rea vs. Kansas City Long Distance Telephone Co., 125 Pacific, 27.

Negligent Construction.

The building and maintaining by two corporations of a line of telephone wires and a line of light, heat and power wires, the latter carrying current at a pressure of 2,200 volts, paralleled and within 10 or 12 inches of each other,

POLES

POLES POLES

BRADLEY TIMBER
and
RAILWAY SUPPLY CO.
DULUTH, MINN.

Write for Quotations on any Quantity

POLES POLES

POLES

Idaho Red Cedar **Poles**

Sandpoint Lumber & Pole Co., Ltd.
SANDPOINT, IDAHO.

Large Stocks—Prompt Shipments
Good Quality—Right Prices

The Arrester that is getting the attention—

WHY?

Because it is killing that expense of making long drives over party lines looking for a partially grounded carbon, the trouble that is so often difficult and expensive to locate. This accounts for this arrester finding its way into almost every rebuilding order. The day of lightning trouble is passing. Write for particulars and prices.

Metallic Lightning Arrester Company
Winona, Minnesota

The Most Satisfactory Medium in the World
— for advertising Poles, Cross Arms, Pins, Brackets, Preservatives, or any other item employed in Telephone construction work, is

TELEPHONY

WRITE US—WE MAKE LOW PRICES

Idaho Red Cedar Poles

☞ 30 CEDAR YARDS IN IDAHO, WASH. & B. C.

WESTERN LUMBER & POLE CO.
Main Office: "Electric" Bldg., Denver, Colo.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

is sufficient, prima facie, to justify a jury in finding each of such corporations negligent in so maintaining the wires. So the Supreme Court of Kansas holds in a recent suit for the recovery of damages to a workman, who ascended one of the telephone poles in obedience to the orders of a superior, and touched the high voltage wire with his hand, being instantly killed.

The electric light wire was built over the telephone wire and sagged about five inches, thus bringing it within five to seven inches of the telephone wire. When the sagging occurred was not shown otherwise than inferentially, in that the service on the telephone wires was interrupted only on the morning of the accident and that efforts had been made by the employes of the telephone company to discover the cause of the interruption without success. The trouble was located in the vicinity where the accident afterwards occurred. Biddle vs. Leavenworth Light, Heat & Power Co., 125 Pacific, 51. (Kansas.)

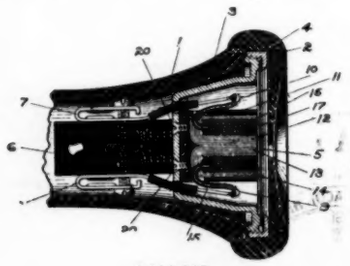
Record of Telephone Patents Recently Issued

1,036,056, August 20, 1912. IMPULSE TRANSMITTER; C. R. Austin, Los Angeles, Cal.; assigned to Southern California Mfg. Co. A dial for use on automatic telephones is described.

1,036,597, August 27, 1912. BATTERY BOX; H. M. Fisk, Watseka, Ill. Comprises a metallic receptacle for dry cells with spring connectors on the cover to connect the cells in series.

1,036,723, August 27, 1912. ELECTRICAL CIRCUIT PROTECTOR; C. A. Rolfe, Chicago; assigned to F. B. Cook. A self soldering heat coil for use on terminal frames.

1,036,805, August 27, 1912. TELEPHONE; W. W. Dean, Elyria, Ohio; assigned to Dean Electric Co. Details of receiver construction are given. They include imbedded U-shaped iron wires, one leg of which forms the core of an electromagnet.



1,036,805.

1,036,809, August 27, 1912. TELEPHONE APPARATUS; C. F. Dolle, Cincinnati, Ohio. Covers a watch case receiver supporting mechanism for use in connection with a desk stand.

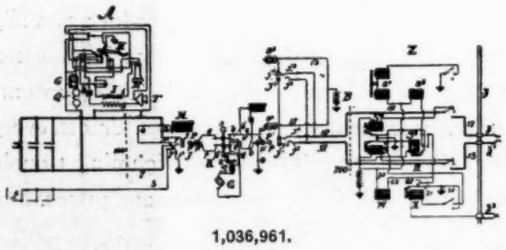
1,036,817, August 27, 1912. POLE CHANGER; C. J. Erickson, Chicago; assigned to First Trust & Savings Bank, Chicago. The main feature is a vibratory reverser for the ringing current.

1,036,818, August 27, 1912. LINE PROTECTIVE DEVICE; J. Erickson, Chicago; assigned to Automatic Electric Co. Comprises a lightning arrester and heat coil protective device for main frames and terminal boards.

1,036,933, August 27, 1912. TRANSMITTER FOR THE DEAF; H. Tideman, Menominee, Mich. The features are two separate, concentric, conical deflectors directed to the resistance cell.

1,036,961, August 27, 1912. TELEPHONE EXCHANGE SYSTEM; E. E. Clement, Washington, D. C.; assigned to North Electric Co., Cleveland, Ohio. Covers a combination of the auxiliary switch, answering jacks and signals in an automanual system.

1,037,053, August 27, 1912. TELEPHONE CALL REGISTER; C. V. Richey, Washington, D. C.; assigned to Richey Telephone Lock & Call Register Co. Describes a lockout device and recording meter combined in one piece of apparatus.



1,036,961.

1,037,172, August 27, 1912. IMPULSE TRANSMITTER; E. E. Clement, Washington, D. C. Comprises a set of push button signal switches adapted to turn a telephone selector wheel through different angles. It is intended for use on a semi-automatic system.

1,037,330, September 3, 1912. SIGNALING SYSTEM; H. O. Rugh, Sandwich, Ill.; assigned to Sandwich Electric Co. Describes a relay controlled, step-by-step selector which is placed at each station with a distributing resistance in the relay circuit.

1,037,438, September 3, 1912. TELEPHONE EXCHANGE SYSTEM; E. E. Clement, Washington, D. C. Covers a semi-automatic party line system with calling equipment and testing facilities.

1,037,447, September 3, 1912, ELECTRICAL APPARATUS; T. F. Crocker, Dayton, Ohio. An automatic system of the Keith type is described.

1,037,537, September 3, 1912. RINGER FOR TELEPHONES; H. J. Roberts, Evanston, Ill.; assigned to Homer Roberts Telephone Co. The features are a permanent magnet and an electromagnet combined to form a polarized ringer.

1,037,636, September 3, 1912. TELEPHONE SYSTEM; J. Kennedy, St. Louis, Mo.; assigned to Dean Electric Co., Elyria, Ohio. Describes interconnecting cord circuits with special reference to the supervisory signals and relays.

1,038,037, September 10, 1912. TELEPHONE SYSTEM; H. G. Webster, Chicago; assigned to Kellogg Switchboard & Supply Co. An automatic ringing system with electromagnetic relay cut-off control is described.

1,038,213, September 10, 1912. SELECTOR FOR AUTOMATIC TELEPHONE EXCHANGES; B. Settegast, Karlhorst, Germany; assigned to Deutsche Telephonwerke G. M. B. H., Berlin, Germany. Relates to the arrangement of the fixed contact banks in an automatic exchange.

1,038,301, September 10, 1912. TELEPHONE AND TELEGRAPH RELAY OR REPEATER; J. H. Cuntz, Hoboken, N. J. A uniformly varying current from an independent source flows through an auxiliary coil. The main coils are in circuit with the line wires and in inductive relation to the auxiliary coil.

1,038,419, September 10, 1912. TELEPHONE CALLING DEVICE; R. C. Nevin, Oakland, Cal. Consists of a make and break device for a number of different signals, which is installed on the upright of a desk stand.

1,038,301.

1,038,605, September 17, 1912. COMPOSITE SYSTEM; O. T. Lademan, Milwaukee, Wis.; assigned to Railway Telephone & Electric Co., Chicago. The telegraph instruments are serially connected in the line and the secondary of the induction coil of the telephones also is in series when transmitting and short circuited when receiving messages.

1,038,317, September 17, 1912. TELEPHONE EXCHANGE SYSTEM; R. H. Manson, Elyria, Ohio; assigned to Dean Electric Co. Describes circuit for connecting a main exchange with a sub-exchange and automatic means for controlling the circuit.

1,038,832, September 17, 1912. RAILWAY TELEPHONE; D. D. Rogers, May, Okla. Describes a method of telephoning from moving trains by means of a line wire and the ground. The line conductor extends alongside the track. A collector attached to a sleeve connects with the car wiring. The car ground wire terminates in a tube and water is used to complete the connection to earth.

1,038,997, September 17, 1912. TELEPHONE SYSTEM; H. G. Webster, Chicago; assigned to Kellogg Swtichboard & Supply Co. Covers a common battery system having a link circuit for connecting with the line. A two wire cord circuit with two control relays for connecting and disconnecting the ringing current is described.

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Personal.

R. E. LINNEY is the new manager of the Missouri & Kansas Telephone Co., at Coffeyville, Kan., succeeding Chas. T. Edwards, who has resigned.

GILL EDWARDS, line chief for the Pembroke Home Telephone Co., Pembroke, Ky., for several years, has been made manager for the Christian-Todd Telephone Co., at Pembroke.

JAMES W. HOUSTON, for years wire manager of the Cumberland Telephone & Telegraph Co., at Owensboro, Ky., has been appointed manager of the McLean county exchanges of the company.

J. H. RICHARDSON, formerly manager of the Sun Telephone & Telegraph Co., at Selmer, Tenn., has been transferred to a similar position at Lexington, Tenn., succeeding J. A. Carpenter, who has been transferred to Corinth, Miss.

H. D. MCVAY, formerly district manager of the Mountain States Telephone & Telegraph Co., with headquarters at Bisbee, Ariz., has been appointed special agent of the same company, with headquarters at Phoenix. He will be succeeded by P. C. Gittings.

W. G. BROREIN, president of the Peninsular Telephone Co., of Tampa, Fla., was a recent visitor at TELEPHONY'S office while in Chicago, on a business trip. Mr. Brorein reports conditions excellent in the territory covered by his system and says the company is hard pressed to keep up with the demand for service.

W. H. MABERRY, who has been manager of the Mississippi Valley Telephone Co., at Hamilton, Ill., has been promoted to the position of superintendent of the station at Carthage and is supervisor of all lines in the western part of Hancock county. Vergil King has succeeded Mr. Maberry as manager at Hamilton.

L. B. EATON, who has managed the Le Roy, N. Y., exchange of the Federal Telephone & Telegraph Co. for the past nine years, has been promoted to the managership of the Federal company's Wellsville and Belmont exchanges. W. C. Phillips, manager of Honeoye Falls and Lima exchanges, succeeeds him. R. D. Smith, formerly wire chief at Honeoye Falls and Lima, has been made manager of these exchanges.

H. M. BENNETT, of Hornell, N. Y., has been appointed manager of the Hornellsville Telephone Co. Mr. Bennett was with the Inter-Ocean Telephone & Telegraph Co. at the time the Hornellsville company was organized and was manager of the latter company for some years. He was prominently identified with the early development and construction of the long distance lines from Hornell west to Salamanca and east to Corning.

A. M. TAYLOR, of Penn Yan, N. Y., has accepted a position with the Federal Telephone & Telegraph Co. as special agent. In 1896 and 1897, Mr. Taylor was building and operating plants in Ohio. He was with the Inter-Ocean company from 1901 to 1906, during which time he was employed in various departments. He had charge of the construction of some of the first toll lines built by the Inter-Ocean company in the southern tier district, took an active part in the development and operation of the Penn Yan exchange and was actively engaged in the Independent telephone business north, east and southeast of Auburn.

Obituary.

ALFRED F. MOORE, head of the well known cord and wire house bearing his name, at Philadelphia, died suddenly, the direct cause being sclerosis.

BURTON L. FREEDY, who recently died at St. Paul, Minn., took up the telephone business as a young man at Bay City, Mich., and served in various capacities in that and surrounding exchanges. At his death he was assistant general manager of the Northwestern Telephone Exchange Co., at St. Paul, Minn.

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